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PATENTS FOR INVENTIONS.

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# A B R I D G M E N T S

OF THE

## Specifications

RELATING TO

SHIP BUILDING, REPAIRING, SHEATHING  
LAUNCHING, &c.

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PRINTED BY ORDER OF THE COMMISSIONERS OF PATENTS.

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## P R E F A C E.

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**THE** Indexes to Patents are now so numerous and costly, as to render their purchase inconvenient to a large number of inventors and others, to whom they have become indispensable.

To obviate this difficulty, short abstracts or abridgments of the Specifications of Patents under each head of Invention have been prepared for publication separately, and so arranged as to form at once a Chronological, Subject-matter, Reference, and Alphabetical Index to the class to which they relate. As these publications do not supersede the necessity for consulting the Specifications, the prices at which the latter are sold have been added.

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B. WOODCROFT.

January 1862.

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## INTRODUCTION.

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OF the many ages which have witnessed the gradual development of the art of ship-building, the period embraced by the following record of inventions is a mere fragment.

On the southern, the eastern, and then on the northern shores of the Great Sea of the Ancients, it gradually grew into consequence, and gave to its cultivators wealth and power. There, in its inland nursery, it remained for many centuries, until, pushing through the Straits of Gibraltar, it found in the Northern Ocean a more congenial home.

Before the date of the earliest invention recorded in these pages, the last attempt of a Mediterranean Fleet to crush the growing power of the North had been made. The great Armada had been swept back by the winds of Heaven, and the victorious fleets of Britain; and Raleigh had written his "exact description of " the unconquerable force of our English Navy," which he declared was at that time able "in dispiht of any Prince " or State in Europe, to command the great and large fields of " the ocean."

He tells us in his Discourse on Shipping\*, that the Royal Navy was twice as strong at the time he wrote, i.e., about the year 1611, as it was in the 24th year of Queen Elizabeth. He says also, "there are in England at this time 400 sail of " merchants, and fit for the wars, which the Spaniards would call " gallions: to which we may add 200 sail of crumsters, or hoyes " of Newcastle, which each of them will bear six demiculverins " and four sakers, needing no other addition of building than a " slight sparr deck fore and aft, as the seamen call it, which is a " slight deck throughout. The 200 which may be chosen out of

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\* A Discourse of the First Invention of Ships, and the several parts thereof; &c., &c.

“ 400, by reason of their ready staying and turning ; by reason of  
 “ the windwardness, and by reason of their drawing of little  
 “ water, they are of extreme advantage near the shoar, and in all  
 “ bays and rivers, to turn in and out. These, I say, alone, and  
 “ well manned, and well conducted, would trouble the greatest  
 “ Prince in Europe to encounter them in our seas ; for they stay  
 “ and turn so readily, as ordering them into small squadrons,  
 “ that three of them at once may give their broadside upon any  
 “ one great ship, or upon any angle or side of an enemies fleet,  
 “ they shall be able to continue a perpetual volley of demi-  
 “ culverins without intermission, and either sink and slaughter  
 “ the men, or utterly disorder any fleet of cross-sails with which  
 “ they encounter.”

“ I say then, if a vanguard be ordained of those hoyes, who  
 “ will easily recover the wind of any other sort of ships, with a  
 “ battle of 400 other warlike ships, and a rear of 30 of his  
 “ Majesty's ships to sustain, relieve, and countenance the rest (if  
 “ God beat them not) I know not what strength can be gathered  
 “ in all Europe to beat them.”

He says further, “ In mine own time the shape of our English  
 “ ships hath been greatly bettered. It is not long since the  
 “ striking of the top-mast (a wonderful ease to great ships both  
 “ at sea and in harbour) hath been devised, together with the  
 “ chain pump, which takes up twice as much water as the ordinary  
 “ did. We have lately added the bonnet and the drabler. To  
 “ the courses \* we have devised studding-sails, top-gallant sails,  
 “ sprit-sails, topsails. The weighing of anchors by the capstone  
 “ is also new. We have fallen into consideration of the length  
 “ of cables, and by it we resist the malice of the greatest winds  
 “ that can blow.” “ We carry our ordnance better than we were  
 “ wont, because our nether-overloops ” (lower-decks) “ are raised  
 “ commonly from the water, to wit, between the lower port and  
 “ the sea.” “ We have also raised our second decks, and given  
 “ more vent thereby to our ordnance ” lying “ on our nether-  
 “ loop. We have added cross pillars in our royal ships to  
 “ strengthen them, which be fastened from the keelson to the

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\* The words “ To the courses ” ought probably to form part of the preceding sentence. The bonnet and drabler were small sails added to the bottoms of the courses.

“ beam of the second deck, to keep them from setting, or from  
 “ giving way in all distresses.

“ We have given longer floors to our ships than in elder times,  
 “ and better bearing under water; whereby they never fall into  
 “ the sea after the head, and shake the whole body, nor sink stern,  
 “ nor stoop upon a wind; by which the breaking loose of our  
 “ ordnance, or the not use of them, with many other discom-  
 “ modities are avoided.”

These quotations from Sir Walter Raleigh have been given, for the purpose of aiding the reader in forming a just conception of the state of the art, at the date of the earliest inventions herein recorded. For the same purpose, it may also be useful to give some idea of a ship-of-war of the period.

It appears that in 1637 a three-decked ship of nearly 150 guns was launched at Woolwich. This ship, the Royal Sovereign, or the Sovereign of the Seas, was designed and built by Phineas and Peter Pett, and was of a very novel construction.

Mr. Phineas Pett, the overseer of the work, was, we are told, a captain in the Royal Navy. His ancestors had held the office of architects of the Royal Navy for 200 years. His son, Mr. Peter Pett, was the master builder, he had made the model of the ship before he was 25 years of age. Of this young man a contemporary writer says,—“ Pallas herself flew into his bosome, and not only  
 “ enjoined him to the undertaking, but inspired him in the  
 “ manageing of so exquisite and absolute an architecture.”

The principal dimensions of this ship were, according to Mr. Fincham :—

Length on the gun-deck	-	-	-	Feet. 173
Breadth extreme	-	-	-	50
Depth in hold	-	-	-	20

Burthen in tons, 1861.

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\* These measurements agree with drawings of the ship which are in existence. They may be considered reliable, although they do not agree with those given by Heywood, who says, “ Her length by the keele is 128 foote, or thereabout, within some few inches. Her mayne breadth or widenesse from side to side 48 foote. Her utmost length,” “ *a prora ad puppim*, 232 foote.” She is “ just so many tuns in burden as there have been yeares since our blessed Saviour’s incarnation, namely, 1637, and not one under or over.”

According to the present mode of computing builder’s tonnage, these dimensions and tonnage do not agree.

It has already been pointed out to the Institution of Naval Architects (*vide*, Transactions for 1860), that there is a remarkable similarity between the

She had three flush decks; a forecastle, and a half deck, above these; a quarter deck above the half deck; and a round house above the quarter deck. There were three masts, the half deck extending as far as the main mast, or about half the length of the ship; the quarter deck was half this length, and the round house half the length of the quarter deck. The guns were arranged as follows:—

“Her lower tyre hath thirty ports, which are to be furnished  
“ with demi-cannon and whole cannon throughout.” “Her  
“ middle tyre hath also thirty ports for demi-culverin, and whole  
“ culverin. Her third tyre hath twentie-six ports for other ord-  
“ nance. Her forecastle hath twelve ports, and her halfedek  
“ hath fourteen ports. She hath thirteene or fourteene ports  
“ more within board for murdering-peesces, besides a great many  
“ loope-holes out of the cabine for musket shot. She carrieth  
“ moreover ten peices of chase ordnance in her right forward, and  
“ ten right aft.”

She had a square stern, framed apparently with transoms, like the sterns which may still be seen in existing ships, but with all the timbers of the frame square, i.e. with their sides lying in transverse planes. There were no jibs or staysails at the fore end of the ship; the only fore-and-aft sail appears to have been what is now called the driver, which was extended on the after part of the cross-jack yard; this yard being slung fore-and-aft, and with its after end pointing upwards.

Charnock says of this ship, “The Royal Sovereign was the  
“ first great ship that was ever built in England; she was then  
“ designed only for splendor and magnificence, and was in some  
“ measure the occasion of those loud complaints against ship-  
“ money in the reign of King Charles I. but being taken down  
“ a deck lower, she became one of the best men-of-war in the  
“ world, and so formidable to her enemies, that none of the most  
“ daring among them would willingly be by her side. She had

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general dimensions and form of bottom of this ship, and the dimensions and form of line-of-battle ships which were built at the close of the last century, and are still in existence. The dimensions of the *Hogue* are, for example,—

Length in the gun-deck	-	-	-	-	-	Ft.	in.
Breadth extreme	-	-	-	-	-	184	0
Depth in hold	-	-	-	-	-	48	4
						21	0

Burthen in tons, 1861.

“ been in almost all the great engagements that had been fought  
“ between France and Holland; and in the last fight between  
“ the English and French, encountering the Wonder of the World,  
“ she so warmly plied the French Admiral, that she forced him  
“ out of his three decked wooden castle, and, chasing the Royal  
“ Sun before her, forced her to fly for shelter among the rocks,  
“ where she became a prey to lesser vessels, that reduced her to  
“ ashes. At length, leaky and defective herself with age, she was  
“ laid up at Chatham, in order to be rebuilt; but, being set on  
“ fire by negligence,” she was destroyed on the 27th January  
1696.

It thus appears that at the commencement of the 17th century, the art of ship-building had been cultivated with such success in England, that vessels of her Royal Navy were not surpassed by those of any other country; and that in their form and general mode of construction, they were not much inferior to the sailing ships of war of the early part of the present century. Indeed, up to the close of the 18th century, there had been nothing except the introduction of artillery to affect in any important degree the practices which had prevailed for ages. Up to that time ships were still built of timbers and plank, and propelled by sails and oars, as they had been for thousands of years. But this century has witnessed a marvellous change. It has seen the introduction both of a new material of construction and a new mode of propulsion. And these have been attended with such success, that the old modes are being rapidly displaced by the new, both in commerce and in war.

At this moment, while artillery, together with the whole system of attack in naval warfare, is undergoing change, it is easy to foresee corresponding changes of equal magnitude in the system of defence; and we may confidently expect that the next few years will witness great and startling improvements in the art of ship-building.

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# SHIP BUILDING, REPAIRING, SHEATHING, AND LAUNCHING.

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A.D. 1618, January 17.—N<sup>o</sup> 6.

**RAMSEY, DAVID, and WILDGOSSE, THOMAS.**—A means of making “boates for the carryage of burthens and passengers  
“ runn vpon the water as swifte in calmes, and more saff in  
“ stormes, then boate full sayled in greate wyndes.”

The patent relates also to instruments for ploughing; to means of improving the quality of land; and to modes of raising water for supplying cities, towns, and houses at a cheap rate.

[No Specification enrolled. Letters Patent printed, 3*d*. No drawings.]

A.D. 1625, August 1.—N<sup>o</sup> 32.

**BEALE, WILLIAM.**—“A newe invencon by hym lately found  
“ out, howe by the vse and applyinge of certen compounded  
“ stufes and waters called or knowen by the name of cement or  
“ dressing for shippes, as well the bulkes, hulles, and bodies of  
“ shippes, and other vesselles, as their mastes, deckes, tackle,  
“ sayles, and other furnitures, maie be p<sup>r</sup>served in fight att sea  
“ from burning or consumynge by wyldefyer or gunpowder, and  
“ alsoe howe by the like meanes such shippes and vessels as are  
“ bound for longe voyages maie, without sheathing or other like  
“ charge, be p<sup>r</sup>served from hurte by the sea worme or barneacle,  
“ whereby manie shippes of greate value are often tymes vtterly  
“ spoyled.” “The said compounded stufes, waters, cement, and  
“ dressing for shippes,” “to be made and extracted out of  
“ certaine myneralls, and native materialls of this our realme of  
“ England and domynion of Wales.”

[No Specification enrolled. Letter Patent printed, 4*d*. No drawings.]

A.D. 1632, June 20.—N<sup>o</sup> 59.

**GRENT, THOMAS.**—“An instrument very p<sup>r</sup>fitable when comon  
“ winde doe faile for a more speedy passage of calmed shippes or  
No. 19.

## SHIP BUILDING REPAIRING.

" other vessels upon the sea or great rivers which may be called  
" the world's mare."

This patent binds also to "a locking glasse" to be used as a  
" fire bell" to "a manual instrument" for the preservation of  
houses and ships from sudden fire: to "a buildinge moule or  
" stone presse:" to a "chamber weatherfall;" and to "a water-  
" worke instrument, which may be called the corrected crane."

[No Specification enrolled. Letters Patents printed, 4d. No drawings.]

A.D. 1636. April 27.—N<sup>o</sup> 92A.

VAN BERG. Sir JOHN CHRISTOPHER.—This invention consists  
in " diverse mechanicke instrumente and frames operating by  
" waighte soe to bee fitted and ordered that the force and strength  
" of them may bee augmented or diminished either in regard of  
" the instrumente themselves or in respecte of the number of  
" workemen to bee ymployed aboute them accordinge as occasion  
" or necessitie shall require—Which instrum<sup>t</sup> or frames may bee  
" exercised by land either belowe on the ground or on highe alofte  
" as well within as without any building And likewise by water  
" in shippes pontes boates and shalloppe for the effectinge any such  
" thinge or thinge as may neede lifting or heaving vpp letting or  
" draweing or halinge from place to place transporting forcible  
" strieking in pullinge forth bearinge downe battering pressing  
" plateinge or squeezing by the vse of them alsoe all manner of  
" thinges maye bee waighed moste conveniently An invencon  
" whereby the anythes bellows may bee made to blowe without  
" putting to any hand either to houlde or drawe them " "Diverse  
" engynes for waterworkes whereby the water may bee compyled  
" to rise that soe itt may bee the better deduced from place to  
" place and naturall streames or currente may be turned or  
" diverted att pleasure likewise divers mill<sup>e</sup> to bee turned or  
" agitated by runnyng rivers or other waters by winde waighte  
" beate as horses oxen and the like or by hande serving for the  
" doing whatsoever thinge may need to bee grinded beaten  
" brused grated pestled hamered cutt hewen hackt sawed whetted  
" playned with tooles turned winded rowled circulated caste forthe  
" or evacuated Alsoe instrumente partly mathematicall partly  
" mechanicall serving for the accurate measuring of land or  
" ground and may alsoe in a certayne manner bee ymployed to  
" move cart<sup>e</sup> waggons or any other thinge that is moved from

“ place to place thereby to knowe the exacte distance and dispatch  
 “ of theire moçon likewise instrument<sup>℥</sup> of sounding and fathoming  
 “ of any depthes whither of waters or mynes or any other depth  
 “ as alsoe to knowe any heighte above the ground Alsoe  
 “ invençons of all kinde of wagons waynes coaches cartes litters  
 “ wheelebarrowes packsaddles and side saddles better for ease  
 “ advantage and proffitt than hitherto have beene vsed other  
 “ instrument<sup>℥</sup> whereby any shipp receaving a leake may bee  
 “ pserved from sinkeinge till ytt may bee brought to shore to bee  
 “ amended or in case such shipp of necessitie must sincke then  
 “ whereby a signe may bee extant above the water to shewe the  
 “ place where it suncke that soe instrument<sup>℥</sup> may bee applyed for  
 “ the draweing itt vpp againe With an assured way howe the  
 “ very greateste shipp may bee drawne vpon agayne though it  
 “ bee suncke eightie fathomes deepe Also instrument<sup>℥</sup> for the  
 “ advantagious removeinge or takeing forth sand or earth out of  
 “ shallowe places ” “ either att sea or in ryvers ” “ Likewise an  
 “ engyne to go contynually by water horse or man for the  
 “ workeinge all sortes of tymber as well greate for carpenters as  
 “ small for joyners and the same to drive diverse frames att once  
 “ each frame takeinge in itt<sup>℥</sup> owne worke and delivering itt out  
 “ agayne without interrupting other Alsoe another invençon  
 “ very good for warminge the bodie of man and for boyling  
 “ roasting or fryeing all kinde of meates ” &c.

“ Another invençon to bee agitated by winde water or horses for  
 “ the cleane threshing of corne ” “ Alsoe a new kinde of washe  
 “ or laundrie howse ” “ Lastly another invençon especially vsefull  
 “ in and aboute the building and repayreing of churches and greate  
 “ edifices howses shippes and the like for the better saveinge the  
 “ excessive charge hee hath hearde is expended in scaffold<sup>℥</sup> in and  
 “ aboute the same.”

[No Specification enrolled. Letters Patent printed, 4*d*.]

A.D. 1661, May 16.—N<sup>o</sup> 132.

TOOGOOD, THOMAS, and HAYES, JAMES.—“ A newe inven-  
 “ çon of forceing water by bellows, not done with wind, as alsoe  
 “ the draweing it vpp with leatherne bagg<sup>℥</sup>, linked togeather  
 “ in manner of buckett<sup>℥</sup>, where the bellows cannot be placed,  
 “ which may bee for the publique benifitt of shipping, drayning  
 “ of mynes, bringing water to houses, emptyeing of rivers or

" pondē, drayneing and watering of groundē, or any way of  
 " pumping water, together with a particuler way of forceing water  
 " through the bottome or sides of shippes belowe the surface or  
 " toppe of the water, which may bee of singuler vse and ease in  
 " navigaçon."

[No Specification enrolled. Letters Patent printed, 4d. No drawings.]

A.D. 1667, October 8.—N<sup>o</sup> 154.

HOWARD, Sir PHILLIP, and WATSON, FRANCIS.—" Whereas  
 " wee have byn informed " " that wee & divers of our subiectē con-  
 " ſidered in shipping are att great charges in the sheathing shippes  
 " for the Streightē & other forreigne partē to defend their sides  
 " from the worme and the vsuall way of graveing vessells with  
 " brimstone, rozin, &c. begettē a roughnesse obstructive to sayling,  
 " and that the " above named " have found a certaine way of  
 " graveing, garnishing, & colouring of shippes, barges, wherryes,  
 " and other vessells," " w<sup>ch</sup> way of graveing will pvent the eating  
 " of the worme & thereby save the sheathing, being much more  
 " cheape & durable, & that the said way of graveing will make  
 " the sydes of the shippes or vessells that they will bee more buyant  
 " and sayle much faster," Letters Patent are granted for the  
 Invention for 14 years.

[No Specification enrolled. Letters Patent printed, 3d. No drawings.]

A.D. 1668, February 18.—N<sup>o</sup> 157.

CHAMBERLAINE, PETER —" A way of makeing severall sortē  
 " of vessellē or fabrickē, small and grate, to navigate in a streight  
 " line, with all windē, though contrary, and to contrive any shippes  
 " or boates to that purpose, which will be many wayes vsfull and  
 " pfitable, both in private and publique workes of strength and  
 " moōon by sea and land."

[No Specification enrolled. Letters Patent printed, 3d. No drawings.]

A.D. 1668, March 2.—N<sup>o</sup> 158.

HOWARD, Sir PHILLIP, and WATSON, FRANCIS.—" A cer-  
 " taine way of graveing, garnishing, and colouring of shippes,  
 " barges, wherryes, and other vessells, and alsoe for the garnishing,  
 " colouring, or varnishing, in ymitation of gilding and otherwise,

“ of wood, iron, stone, plaister, and other thinge, by a liquor  
 “ drawne from certaine graine growing within this kingdome of  
 “ England, and some other ingrediente,” “ w<sup>ch</sup> way of graveing  
 “ will not onely p<sup>r</sup>serve the said shippes and vessells more then  
 “ ordinary graveing, but will alsoe render the said shippes or  
 “ vessells, by the smoothenesse thereof, apter to sayle; and the  
 “ said way of varnishing, garnishing, and colouring of wood and  
 “ other thinge is of a great and long endurance, and much cheaper  
 “ than what hath byn hitherto vsed.”

[No Specification enrolled. Letters Patent printed, 3*d*. No drawings.]

A.D. 1670, January 1.—N<sup>o</sup> 158\*.

HOWARD, Sir PHILLIP, and WATSON, FRANCIS.—“ A new  
 “ manufacture art or inven<sup>con</sup> to preserve shippes and other  
 “ vessells under water, with certaine comodities chiefly of the  
 “ growth of his Ma<sup>ties</sup> dominions, which is much cheaper and more  
 “ smooth and durable than any way by dealers for sheathing or  
 “ pitch tarr rozin brimston or any graving hitherto used.”

[No Specification enrolled. Act of Parliament printed, 3*d*. See N<sup>o</sup> 254.]

A.D. 1677, March 10.—N<sup>o</sup> 197.

CASTLE, WILLIAM, and EWBANKE, HENRY.—“ Certaine  
 “ secure & comodious fire hearths for shippes made of iron, copper,  
 “ and other mettalls, by meanes whereof shippes & vessells may  
 “ bee the better p<sup>r</sup>served from burning, which doeth often happen  
 “ from the fire hearths that have beene hitherto vsed.”

[No Specification enrolled. Letters Patent printed, 4*d*. No drawings.]

A.D. 1678, October 4.—N<sup>o</sup> 205.

LEDGINGHAM, ROBERT.—“ Severall engines of extraordinary  
 “ vse for discharging water out of mines and shippes, wetting of  
 “ sayles, quenching of fire, & such other vses, whereby hce can  
 “ raise greate quantyies of water higher and with farre less  
 “ p<sup>r</sup>por<sup>con</sup> of strength then can bee performed by any other engine  
 “ yett extant.”

[No Specification enrolled. Letters Patent printed, 3*d*. No drawings.]

A.D. 1678, February 11.—N<sup>o</sup> 207.

HARVEY, THOMAS.—“ An engine for the drawing of both  
 “ Spanish and Swedish iron into all sorts of rounds for bolts for

“ shipping and other vses in a much better and more expeditious  
 “ manner then the same have hitherto bin performed by the  
 “ smith's hammer.”

“ By the helpe of this engine all sorts of round iron for ship-  
 “ ping ” “ will be much better and cheaper made here in our  
 “ realme of England then hitherto the same have bin.”

[No Specification enrolled. Letters Patent printed, 3d. No drawings.]

A.D. 1679, May 23.—N<sup>o</sup> 208.

BURTON, GEORGE, PLOTT, SILVESTER, and DEIGHTON,  
 JOHN.—A means of raising water out of ships, mines, &c. by the  
 use of “ pipes, engines, and vessells.” The invention relates also  
 to the draining of land by pumping, and to the management of  
 water wheels.

[No Specification enrolled. Letters Patent printed, 3d. No drawings.]

A.D. 1682, November 21.—N<sup>o</sup> 223.

WINDSOR, THOMAS Lord, PITT, GEORGE, and DRAPER,  
 CHURCHILL.—“ Makeing of wett harbours and docke to hold all  
 “ sorte of shippes, to lye tenne, twenty, thirty, or forty foot above  
 “ high-water marke,” so as “ by engines and other wayes, and  
 “ with the helpe of three men onely, to take the greatest shipp of  
 “ burthen out of the river of Thames into the said harbour, tenne.  
 “ twenty, thirty, or forty foot above high-water marke, and by the  
 “ said means deliver any shipp into the river of Thames againe,  
 “ and ” also to “ deliver the greatest shipp from the stocke into  
 “ the said harbour, and from the harbour vpon the stocke againe :”  
 the said dock or harbour to “ preserve shippes from decay and from  
 “ fire and enemyes ” better “ then nowe they are.”

[No Specification enrolled. Letters Patent printed, 3d. No drawings.]

A.D. 1684, February 27.—N<sup>o</sup> 232.

WYNDUS, EDWARD.—“ A discovery of a new experiment for  
 “ the great and durable increase of light by extraordinary glasses  
 “ and lamps,” “ for the great improvement of ship lanthornes,  
 “ lighthouses, dispersing of light in mines, and other necessary  
 “ and like profitable vses which require light and heat.”

[No Specification enrolled. Letters Patent printed, 3d. No drawings.]

A.D. 1685, October 17.—N<sup>o</sup> 247.

CORCELLIS, CHARLES.—“ A new way of makeing pitch or tarr,  
 “ which will preserve shipps from being eaten by worms, of what  
 “ wood<sup>e</sup> soever they are built, without sheathing the vessell<sup>e</sup>, or  
 “ makeing use of tallow or any other matter to carreen them, the  
 “ said pitch or tarr p<sup>r</sup>eserving all sort of wood from corrup<sup>t</sup>ion, and  
 “ remayning vpon itt six times longer then the ordinary sort,  
 “ without melting in the sun, and for some time resisting even  
 “ fire.”

[No Specification enrolled. Letters Patent printed, 3d. No drawings.]

A.D. 1687, August 13.—N<sup>o</sup> 254.

HOWARD, Sir PHILIP (deceased), and WATSON, Sir FRANCIS.  
 —Letters Patent for this invention consisting of “ a new manufac-  
 “ ture, art, or invention, by a certaine engine or rollers to draw,  
 “ roll, or mill plates or sheets of lead by them cast or prepared  
 “ for that purpose,” granted to Richard Kent, Charles Davenant,  
 Thomas Agar, John Warter, Thomas Hale, and Michael Hale,  
 “ as well for sheathing of shipps as for any other vse or purpose  
 “ whatsoever ” for 14 years, inasmuch as the grant to Howard  
 and Watson by Act of Parliament in 1670 for 25 years was “ for  
 “ the sheathing and preserva<sup>t</sup>ion of shipps and shipping onely ; ”  
 and “ since the passing of the said Act ” the above named parties  
 had found “ the said manufacture, worke, or invention of mill’d  
 “ lead ” to “ be of good vse for many other purposes as well as  
 “ sheathing of shipps.”

[No Specification enrolled. Letters Patent printed, 4d. It appears from a work on Architecture, written by Leon-Battista Alberti in the fifteenth century, that lead sheathing was used in the second century. He informs us that “ Trajan’s ship ” was weighed out of the lake of Riccia while he was compiling his work, where it had lain sunk and neglected for above 1300 years. He observed that the pine and cypress of it had lasted most remarkably. On the outside it was built with double planks, daubed over with Greek pitch, and caulked with linen rags ; and over all there was lead sheathing fastened on with little copper nails.]

A.D. 1692, January 11.—N<sup>o</sup> 287.

GLADWIN, THOMAS.—“ A new sort of engine to cleare water  
 “ out of shipps (much better then any chaine pumps), and to  
 “ quench fire in them or in houses vpon any accident, and for  
 “ draining of mines ” “ by a much easier way than yet ever was  
 “ practised.”

[No Specification enrolled. Letters Patent printed, 3d. No drawings.]

A.D. 1695, July 12.—N<sup>o</sup> 340.

**LEDGINGHAM, ROBERT.**—"A sort of chaine pumps an hand  
" pumps which are more serviceable and of greater advantage for  
" shippes of warr and merchant shippes then any that have been  
" hitherto discovered, both in regard of carrying off neare double  
" quantity of water, and withall the sheltring very much the men  
" exposed to shott."

[No Specification enrolled. Letters Patent printed, 3*d*. No drawings.  
An earlier record of chain pumps appears in a discourse of Sir Walter Raleigh, written in about 1611, in which he says, "Together with the chaine-pumps, which takes up twice as much water as the ordinary did, we have lately added the bonnet and the drabier."]

A.D. 1695, August 2.—N<sup>o</sup> 341.

**ARDESOIF, CHARLES**—"A new invented composition which  
" will preserve ships from the worms, insoemuch that any ship may  
" by virtue of the same continue at sea for the space of four or  
" five yeares without receiving any damage from the worms."

[No Specification enrolled. Letters Patent printed, 3*d*. No drawings.]

A.D. 1697, September 24.—N<sup>o</sup> 352.

**OLDNER, GEORGE, and PRUNE, ANDREW.**—"A new inven-  
" tion for the better preserving of all sorts of shippes or vessells for  
" navigation," from foundering by reason of any leake however  
" produced; " to be effected by a contrivance of worke to be done in  
" the inside of any ship or other vessell for navigation, and that  
" the said contrivance of worke will neither hinder the saileing nor  
" the stowage, by meanes whereof all water that may enter the  
" hold of the ship or vessell by reason of any leake, shall, in most,  
" if not all cases be freed or cast out by two pumps, part of the  
" said invention that shall not take vp more roome nor require  
" more strength than common pumps."

[No Specification enrolled. Letters Patent printed, 3*d*. No drawings.]

A.D. 1706, June 6.—N<sup>o</sup> 377.

**ALDERSEY, ROBERT.**—"A floating dam, " by meanes of which  
" he is able to carry barges, lighters, and other vessells over the  
" greatest flats and shallows in any navigable river "

[No Specification enrolled. Letters Patent printed, 3*d*. No drawings.]

A.D. 1718, May 21.—N<sup>o</sup> 419.

STEELE, Sir RICHARD.—“A certain vessell which by the structure thereof can bring fish wherever caught to any distant place alive and in health.”

[No Specification enrolled. Letters Patent printed, 3*d*. No drawings. Mr. Thackeray says in “The English Humourists,” “Steele, about this time (1717), was much occupied with a project for conveying fish alive, by which, as he constantly assures his wife, he firmly believed he should make his fortune. It did not succeed, however.”]

A.D. 1720, April 14.—N<sup>o</sup> 427.

CUMBERLAND, JOHN.—“A new method for heating and making plank plyant, so as to bend and be wrought to any form required on any of our ships of our royal navy, at less than one-third part of the present charge, and in one-fourth part of the time.”

He had, by order of the Commissioners of the Navy, erected a machine in the royal dockyard at Deptford for the purpose of heating plank, and had heated and wrought plank from one inch to seven inches in thickness on board several of the royal ships, to the satisfaction of the Commissioners.

[No Specification enrolled. Letters Patent printed, 3*d*. No drawings. Mr. Fincham says, in his History of Naval Architecture, “The practice of stoving timber owed its origin to a Mr. Cumberland, to whom, as a compensation for his useful discovery, was granted a tenth part of the saving which should result from the use of it” (in the royal dockyards?) The “process consisted in placing the thickstuff and planks in wet sand, and subjecting it to heat of such a degree and for such a time as were deemed the best suited to extract the remaining juices of the wood, and to bring it to the condition of suppleness that was required in using it.” Before the introduction of this invention the process of charring was in general use. This consisted in subjecting the inner surface of the timber to the action of fire, while the outer surface was kept wet, until the requisite degree of suppleness was obtained. The same writer informs us that the practice of stoving was retained in the royal dockyards until 1736.]

A.D. 1721, August 12.—N<sup>o</sup> 434.

DE LA CHAUMETTE, ISAAC.—In the Letters Patent, part of the invention is stated to consist in “a method to prevent shipwrack beyond all that have been hitherto vused;” but no further explanation is given.

[No Specification enrolled. Letters Patent printed, 4*d*. No drawings.]

A.D. 1723, November 12.—N<sup>o</sup> 458.

GODFREY, AMBROSE.—(Partly a communication.)—“A new invention for extinguishing fires” in houses and ships “by explosion

" and suffocation." The materials of the said invention " consist  
 " of casks and oth vessells of severall formes and sizes, some of  
 " which are filled with water only, others with water and " a cer-  
 " tain " chymical preparation together, and others with the said  
 " chymical preparation mixt with other dry matters without any  
 " water; and in each of the said vessells is a charge of gun-  
 " powder " " contained in a tin or other box which has a double  
 " neck, by which it is fastned to each end of the vessell; and  
 " through one of the said necks there is fixt a fuse of wild-fire,  
 " by which the said gunpowder is to be fired and blown vp; and  
 " the said vessells so filled and prepared as aforesaid, are (vpon  
 " occasion of any fire) to be made vse of by firing the said fuse,  
 " and then flinging the said vessell into the place where the fire is  
 " broke out, which, vpon the explosion of the gunpowder, blasts  
 " out all the flame, and the water or the other ingredients which  
 " were in the vessell are forceably driven by the gunpowder against  
 " the parts that were on fire, and so damp and suffocate the same  
 " so effectually that any man may safely enter the place, and with  
 " proper implements may totally extinguish the remaining fire."

[No specification enrolled. Letters Patent printed, 4d. No drawings.]

A.D. 1724, April 15— N<sup>o</sup> 466.

MASON, WILLIAM, and CHAMFLOWER, THOMAS.—" A  
 " new machine called a siphon, or an attracting engine that works  
 " without friction of solids so long sought after by the ingenious,  
 " but not happily discovered till the said invention, partly by  
 " attraction, and partly by force, and is composed of two tubes,  
 " one within the other, lifting vp the water through its own  
 " cavity by the aid of some relieving valves placed at proper dis-  
 " tances one above the other, and is moved by a peculiar power  
 " containing two segment( of a circular wheel, and two short  
 " chains reverted on each segment, for lifting vp and forcing  
 " downe the inward tubes, and in regard it would be liable to  
 " few or none of those accidents to which all engines hitherto in-  
 " vented are subject, by reason of its being worked without  
 " friction, it would be of unspeakable value for preserving of ships  
 " of warr in engagement, and merchantmen diversity of distress  
 " at sea." It is " capable to discharge near one thousand  
 " gallons of water twenty foot high, with the help of few men, in  
 " the space of a minute."

[No specification enrolled. Letters Patent printed, 4d. No drawings.]

A.D. 1724, December 23.—N<sup>o</sup> 473.

WHITE, HENRY.—An engine for raising water in ships and discharging water therefrom, and for other useful purposes “so contrived that by the application of any power, as the strength of man or beast, wind, or fall of water, vacuums are made by a crank working boxes or forcers near the top of the said engine, by means whereof the water constantly ascend<sup>z</sup> through a tube or set of tubes from any depth proposed, even five hundred feet or more, by the pressure of the atmosphere only during such applica<sup>z</sup>on.” The engine will take up “no more room in a ship, nor power to work it than a common pump, and will with much less labour and pains discharge eighty gallons in a minute, which is at least double the quantity vsually discharged by com<sup>o</sup>n pumps.” “As a further conveniency, it” is so “ordered that by the addi<sup>z</sup>on of a leather hose and pipe instantly to be fixed to the said engine, the water” may “not only be raised but discharged on any part of the ship’s deck or rigging, in case a fire should happen in the same.”

[No Specification enrolled. Letters Patent printed, 4*d*. No drawings.]

A.D. 1725, June 3.—N<sup>o</sup> 478.

PAION, DANIEL.—“A certain mixture or prepara<sup>z</sup>on, which being applied and well paied to the bottom of any vessell or elsewhere, will so far penetrate into the plank as to become one substance with the wood to which it is laid on and paied, as aforesaid, keeping the worms from eating through the” plank, preserving the same from decay, and entirely freeing the bottom from other accident<sup>z</sup>.” “The said prepara<sup>z</sup>on will, when laid on as it ought to be, not only hinder the shipping from taking fire, but is also so farr a destroyer thereof as to extinguish the heat of an iron bar before it can penetrate or make any impression on the wood whereon mixture is laid vntil the same is entirely worne off, and so hard and dureable that it stand<sup>z</sup> prooffe vnde line, and is as a case of steel to a ship against sand<sup>z</sup>, preserving the same from rubbing or other accidents happening to ships; by falling vpon sand<sup>z</sup>.”

[No Specification enrolled. Letters Patent printed, 4*d*. No drawings.]

A.D. 1728, May 9.—N<sup>o</sup> 497.

ROBINSON, BENJAMINE, and HAUKEBEE, FRANCIS.—A new method of sheathing, and of preserving the plank of ships. The nature of this invention is as follows:—The sheathing consists of “rooled copper, brass, tinn, iron, or tinned plates,” or of “a composition formed out of either or all of these metals amongst themselves, or with other metals or minerals;” and where it is not thought necessary to sheathe the ship in this way, “the whole outward surface” of the ship or vessel is to be covered with a “paint or paste-like composition,” which will a short time become hard and tough, and defend the external surface from the worm. And the method of preparing the boards, timbers, planking, &c., to be used in ships which do not require sheathing with metal, or of preparing boards for the sheathing of such ships, is—First, to subject them to heat to extract the vegetable juices and open the pores, then to impregnate them with animal or vegetable oils, and afterwards with a saline solution “prepared from sea salt and the salts of animals, vegetables, or minerals,” the combination of which with the oil forms a “gummy” or “bituminous” lining within and upon the surface of the material, and prevents decay.

[Printed, 8d. No drawings. Referred to in Rolin Chapel Reports, 6th Report, p. 155.]

A.D. 1730, May 9.—N<sup>o</sup> 516.

HOLMES, WILLIAM.—Method of building ships and vessels in a “new way or manner invented by the petitioner being a secret never yet found out or practised by any other person,” especially “a pole mast vessell for the better and more expdious and easy cat’ling, preserving, and stowing of all sorts of fish, with fewer handC, and with much” less “trouble than vsual”

[No Specification enrolled. Letters Patent printed, 4d. No drawings.]

A.D. 1731, October 18.—N<sup>o</sup> 534.

REYNOLDSON, GEORGE.—“A machine that gives exactly the way a ship makes, and counts her leeway; that tells what speed the winds blow, and proves the different force of current in any depth, as also a machine that will retard the ship’s driving upon a lee shore where there is no anchoridge, or being forced back in her voyage by contrary winds.”

[No Specification enrolled. Letters Patent printed, 4d. No drawings.]

A.D. 1736, May 22.—N<sup>o</sup> 554.

**WATTS, JOHN.**—A newly invented form of the immersed parts of the hulls of all kinds of ships and vessels approximating “to the solled of least resistance.” This form is to be obtained by making all the transverse sections circular and convex to the water, and all the horizontal sections, and sections parallel to the keel, convex to the water from the stem to the stern. To facilitate this, and to give “greater length and breadth of floor,” the stem and stern post are to have little or no rake, and the stem but little curvature.

[Printed 3*d*. No drawings. Referred to in Rolls Chapel Reports, 6th Report, p. 155.]

A.D. 1737, June 13.—N<sup>o</sup> 557.

**EMERTON, ALEXANDER.**—This invention relates to covering and painting the timbers, planks, and boards used in vessels and in other places. It consists in preparing the timber materials with boiling oils brought to a glutinous consistency, and putting on them severall thicknesses of “compounded poisons, powdered glass, stone, dust, and sand, cemented with the strongest compound of severall sorts of painting colours and oyls;” then painting over the whole with a strong body of compounded colours and oyls.”

[Printed, 3*d*. No drawings. Referred to in Rolls Chapel Reports, 6th Report, p. 156.]

A.D. 1737, October 13.—N<sup>o</sup> 559.

**PEYN, JAMES.**—“Worm Pitch, being a composition of spiritual and corporeal ingredients, which being applied to ships and vessels employed at sea and navigating to the coasts of Africa, America, and the East Indies, and other hot countries, infallibly resists the fretting and corroding of sea worms, preserves the timber, and keeps the seems close in warm climates far better and much longer than any of the ordinary rosin and other materials ever heretofore made use of, and is very usefull in preserving the inside as well as the outside of ships and vessels, of all which qualities he has given many and sufficient proofs in the provinces of Holland and Zealand, in which last province the said worm pitch is in great repute.”

[No Specification enrolled. Letters Patent printed, 4*d*. No drawings.]

A.D. 1742, July 30.—N<sup>o</sup> 585.

**TUTTE, JOHN.**—An improved engine for raising water to save ships "from sinking by springing leaks at sea." It consists of a "joynted bar or chain" having "boxes or tubes" fastened to it at intervals to hold the water. This bar or chain is raised by a toothed wheel set on a horizontal axis, which axis is set in motion by a combination of toothed wheels working one in the other, and driven by men, by horses, or by wind. They may also be driven "by water, in such manner as to be made to work with the water raised thereby"

[Printed, 3d. No drawings. Referred to in Rolls Chapel Reports, 6th Report, p. 130.]

A.D. 1744, March 16.—N<sup>o</sup> 602.

**SUTTON, SAMUEL.**—A "new invention or method for extracting "foul air out of ships," and for removing all noxious air whatsoever from "mines and caverns in the earth, dungeons, prisons, "and all infected places" "The said invention may be likewise "used in hot-houses and wails, which will greatly warm the earth "for the speedy production of its fruits, and also in granaries for "the preservation of corn and grain"

[No Specification enrolled. Letters Patent printed, 4d. No drawings.]

A.D. 1753, March 29.—N<sup>o</sup> 678.

**CRAVEN, THOMAS** — This invention consists of "a pair of "pumps, the barrels whereof are made of lead or brass, for the use "of merchants' ships or colliers" Each of the pumps is composed of a round barrel in which a valve box is worked by a spear and brake, and from which a straight pipe leads into the hold. Both these barrels communicate with a single cistern attached to a square wooden stanchion passing through both decks, and extending from a few feet above the upper deck, to a few feet below the lower deck. This stanchion, together with the cistern and pumps, can be raised or lowered at pleasure, to keep the lower end of the pipes in the clear water, and can be fixed by a pin through the heel of the stanchion on the lower deck. The brakes or handles are worked on the head of the stanchion above the upper deck. When there are no other pumps both the handles stand athwartship, when it is used in combination with the old wooden pump, one handle works fore-and-aft, and the other athwartship:

the top of the cistern is covered, and the spears pass through holes in the cover.

[Printed, 6d. Drawings. Referred to in Rolls Chapel Reports, 6th Report, p. 127.]

A.D. 1754, May 21.—Nº 690.

LEWIS, JOHN.—A new method of preparing from the American pitch pine tree a varnish of pine for paying ships' sides and masts, and for preserving timber buildings from decay.

According to this method common "plantation tar" is distilled, and the product of the distillation is mixed with a certain proportion of "fine claryfied turpentine," from which all the "acid watery particles" have been evaporated.

[Printed, 3d. No drawings. Referred to in Rolls Chapel Reports, 6th Report, p. 128.]

A.D. 1755, April 2.—Nº 699.

WRIGHT, STEPHEN.—"A new invented machine or windlass, for the more easy weighing a ship's anchor at sea, which is worked with as much ease by four men as the windlass now in use can be by seven; as also a new-invented machine or wheel, for the more easy working of ships' pumps, whereby as much water may be raised by two men in the same space of time as is now done by the labour of four men with the common pumps now in use."

The inventor describes a windlass supported by carrick bitts at which, as well as at the pawl bitt, pawls are fitted. Two turns of the cable by which the anchor is suspended are taken round the body of the windlass, and then a jigger tackle is hooked on to it, the fall of which is led to a wheel similar to a steering wheel, by which the anchor is then hove up.

He then describes the application of a similar wheel to ships' pumps. Two suction pumps are shewn placed opposite to each other, and having a wheel fitted between them, the diameter of the barrel of which is equal to the distance between the spears of the pumps, i.e. about two feet.

Round this barrel 48 cogs are cut, and the pump spears have "a number of holes at equal distance from each other so as to fit exactly on the cogs on the barrel of the wheel;" the spears are kept in contact with the barrel by means of rollers. It appears

that the pumps would require to be worked by a reciprocating action of the wheel. The inventor says,—“Where the spokes” to the wheel “are not convenient we fix pendulum on the axis of the wheel.”

[Printed, 6d. Drawings. Referred to in Rolls Chapel Reports, 6th Report, p. 128.]

A.D. 1763, March 3.—N° 785.

**BURNE, CHARLES.**—“Two certain kinds of keels or vessels, “depending partly upon each other, by which ballast may be “taken out of ships, sand beds in rivers taken up, harbours “deepened, banks of sand and gravel at the entrance of ports “removed and conveyed into a sufficient depth of the sea at a “much less expence, and not so great a nuisance by far to the “rivers and receivers as the present or any other method hitherto “invented for that purpose.” The two keels or vessels are each in breadth about 24 feet, and in length, one 33 and the other 55 feet. The short one, the dredging keel, is merely a strong floating platform on which a horizontal wheel is fixed to be turned by a horse. To this wheel ropes are brought from the dredges worked at the sides of the carrying vessel which is moored astern. As the wheel is turned by the horse, one dredge is hauled home to the side of this vessel, while the other on the opposite side is slackened out. When the carrying vessel is filled a mast and sail are hoisted, sliding keels are lowered, and she is navigated to any required place, the dredging vessel remaining at the moorings. There is a short deck at each end of the carrying vessel, and a fore-and-aft platform in the middle connecting them. The ballast rests on inclined planes leading from this platform to the sides of the vessel, and terminating in spouts at two ballast ports on each side, to facilitate its discharge.

[Printed, 10d. Drawings. Referred to in Rolls Chapel Reports, 6th Report, p. 132.]

A.D. 1766, July 31.—N° 854.

**PURNELL, JOHN.**—“New-invented machine for making ship “bolts, large round rods of iron and steel, and iron and steel “wire of various sizes, that is in many respects far more service- “able and preferable than any method that has hitherto been “made use of for that purpose.” This machine consists of a pair

of cylindrical rollers working into each other, grooves being cut in one of them of the several sizes required for the rods, and corresponding projecting rings wrought on the other. The faces of both grooves and rings are hollowed in the form of a semi-circle, so that where they are in contact a perfect circle is formed. The shaft or axis of one of these rollers has a rotary motion given to it by a water-wheel, and this is communicated to the other roller by means of two cog-wheels, one of which is set on the axis of each of the rollers.

[Printed, 6d. Drawings. Referred to in Rolls Chapel Reports, 6th Report, p. 159.]

A.D. 1766, November 26.—N<sup>o</sup> 865.

BARBER, JOHN.—“ An entire new method of raising water out  
“ of mines and ships, and for supplying cities, towns, and other  
“ places with water, and in general for raising ponderous weights  
“ of all kinds, particularly coals out of mines, by fire, by water,  
“ or by both jointly.”

The inventor describes three kinds of engines. The first is a  
“ fire-engine for raising of water for various purposes,” worked by  
means of the expansive force of steam in “ one, two, or more  
“ cylinder or cylinders.” The second is an engine “ for raising  
“ ponderous bodies by water, particularly coals and ore from mines  
“ and deep winings.” The third is “ an engine to raise pon-  
“ derous bodies ” by the agency of steam. He proposes also to  
modify the latter engines so as to obtain the joint action of steam  
and running water. He states in conclusion that his “ intent and  
“ meaning is, the applying of the power or powers, as fire or water,  
“ jointly or seperately, in any mechanical form, to give motion to  
“ any ponderous bodies, fluids, vapour, or to extract foul air out  
“ of mines or other places variously applied.”

[Printed, 10d. Drawings. Referred to in Rolls Chapel Reports, 6th Report, p. 135.]

A.D. 1766, December 17.—N<sup>o</sup> 866.

LEVY, ISAAC.—“ New-invented method for conveying of timber  
“ from beyond sea by floating machine.” The following is the  
specification of this invention :—“ I declare that timber or wood  
“ of any kind, sort, dimensions, and form will be made use of and  
“ (in ?) the construction of the said floating machine, which will  
“ in its external form be somewhat similar to and like that of a  
No. 19.

“ ship. The construction otherwise will be chiefly by traversely  
 “ laying, and by upright and angular ways, and position of timber  
 “ or wood, fastened and held together by iron and wooden trun-  
 “ nells, with or without plank, on the bottom, sides, and waist;  
 “ to have deck or decks, or floor, if convenient, with pump room,  
 “ cabins, or other proper rooms, for the use and shelter of the  
 “ navigators, wherein also to lodge or stow the necessary provi-  
 “ sions for the voyage, with whatever else shall be thought proper,  
 “ material, and convenient to the safety of navigation; to be  
 “ ballasted with iron, iron ore, or other metal, ore, or stones, and  
 “ to have no vacuity or room in the said floating machine but for  
 “ the purpose aforesaid; to be provided with a rudder, masts,  
 “ yards, bowsprit, sails, anchors, and cables, and to be rigged in  
 “ a manner as shall best answer and conduce to the facility and  
 “ security of navigation. ’

[Printed, 3d. No drawings. Referred to in Roils Chapel Reports, 6th Report, p. 159.]

A.D. 1767, July 4.—N<sup>o</sup> 879.

WINN, JOHN —A certain machine or engine for the following  
 “ beneficial uses and purposes :” “ First, to get a rope on shore in  
 “ case of a ship’s being in distress on a lee shore, on a rocky  
 “ beach, where a boat cannot live, secondly, to bring people on  
 “ shore when a ship is aground or wrecked, and the men are  
 “ fatigued by pumping or otherwise working the said ship;  
 “ thirdly, to convey persons from on shore on board a ship for her  
 “ assistance, which, if she makes no more water than her pumps  
 “ can free, may be the means of saving her; fourthly, to convey  
 “ people out of a ship at the distance of fifty or sixty fathoms, in  
 “ case of her going on shore at half-ebb in a rocky beach and  
 “ taking the ground, even supposing the rock or land to be  
 “ ninety or one hundred feet high; fifthly, to convey boxes or  
 “ bails of merchandize out of a ship when in distress; sixthly, to  
 “ convey a family, by one or two at a time, into the street, or into  
 “ an opposite house” from a house on fire in the lower part. The  
 machine consists of a cradle capable of sliding along a rope  
 to which it is slung, and having a line at each end to haul it to  
 from the vessel. The “ sliding rope ” is fixed at one end to some  
 part of the vessel in distress and at the other to some object on the  
 shore. It is proposed to get this rope from the ship to the shore

by attaching the end of it to a cask or buoy, which is allowed to be driven in towards the shore by the force of the waves; grappling irons are then thrown out from the shore to seize the buoy, and thus obtain the end of the rope.

[Printed, 6d. Drawings.]

A.D. 1767, December 18.—N<sup>o</sup> 887.

**SMITH, JOACHIM.**—A compound preparation to “preserve the bottoms of ships, and other vessels that use the sea, from being eaten into or honey-combed by worms or other insects” which is more effectual than covering the ships’ bottoms with filling nails or even copper.” The operations are as follows:—Reduce glass by pounding to very small pieces but not to a powder. The glass thus prepared is attached to paper, planks, or boards by means of one of the following mixtures. First, “tar, pitch, turpentine, & white lead, or any other kind of paint ground in oil.” The surfaces to be protected are payed over with this mixture in a heated state, and the prepared glass is mixed in with it close and firm while it is hot.

Secondly, boil together tar and oil “of each a proper quantity,” then mix lime and the prepared glass until it has the consistency of mortar. Pay the surfaces over with tar, and lay on this mixture with a trowel, pay with tar again, and strew the pounded glass over it. For sheathing, it is preferred “to fasten the whole of the first-mentioned composition, viz., of glass, tar, pitch, turpentine, white lead, &c., on and in paper, so as to have the paper on both sides of the composition, which, when made, may very properly be called glass sheets.” “The sheets being thus duly prepared are to be tarred over on one side, which side is to be applied to the ship’s bottom” “and nailed on in such a manner as that the edge of one sheet shall lap a little over that which is contiguous to it.”

“The operation is to be compleated by covering the whole with sheathing boards in the usual way, through which the worm may pass, but it is apprehended he will in the glass sheets meet with his ne plus ultra.”

[Printed, 4d. No drawings. Referred to in Rolls Chapel Reports, 6th Report, p. 135.]

A.D. 1768, December 9.—N<sup>o</sup> 910.

**JACKSON, HUMPHRY.**—A mode of “effectually hardening, toughening, or rendering very flexible and preserving wood and

“ timber in general from speedy rotting and decay, particularly  
 “ oak and elm plank, as well as the largest oak and elm timber  
 “ used in buildings and constructing ships of war, and all other  
 “ ships or vessels,” “ likewise for defending and preserving the  
 “ same from being eaten and destroyed by ” “ sea worms, and  
 “ which art is particularly adapted to render oak timber and wood  
 “ in general, the produce of our colonies in America ” equal to  
 “ the best woods and timbers, the growth of Great Britain or  
 “ foreign countries, in all their properties.” The mode of opera-  
 “ tion is as follows :— Let the wood “ be boiled several hours in a  
 “ very strong solution of any calcareous earth, in water, or in any  
 “ acid whatever, except the acid of vitriol ; then add as much acid  
 “ of vitriol, or any substance that contains it, as will exactly  
 “ neutralize the solution,” and boil the wood as before ; it must  
 then be taken out and dried. If the wood be of a hard nature it  
 should be first boiled “ in soap ley, which must afterwards be  
 “ neutralized and boiled again,” as directed above. Treennails,  
 and any part of the ship very subject to decay, must be afterwards  
 “ impregnated with spirits or oil of turpentine, mixed with oil of  
 “ any kind, and a portion of alkaline salt.” Fearnought or any  
 other cloth of similar fabric is impregnated with a solution of  
 arsenic and copper, “ then boiled in water with coloquintida, after-  
 “ wards dried and dipped in balsam of sulphur, made with animal  
 “ oil.” The bottom is covered with this prepared cloth, and then  
 sheathed with boards payed over in the usual way.

[Printed, 3d. No drawings. Referred to in Rolls Chapel Reports, 6th  
 Report, p. 130.]

A.D. 1768, December 16.—N<sup>o</sup> 911.

COLE, WILLIAM. —“ A chain pump entirely upon a new con-  
 “ struction, for raising water out of ships, or draining of lands, or  
 “ for any other purpose where a chain pump can be applied or  
 “ made use of,” “ so contrived that any defect therein can be  
 “ repaired in a very short space of time, which no other pump on  
 “ the old construction can be.” The “ said pump having been  
 “ tried before our trusty and welbeloved Admiral Sir John Moore,  
 “ Baronet, on board our ship Seaford, and several of our navy,  
 “ and ” having “ been fully approved of.”

[No Specification enrolled. Letters Patent printed, 4d. No drawings. See  
 No. 902.]

A.D. 1771, January 17.—N° 982.

**BENTINCK, JOHN**, Captain in His Majesty's Royal Navy, and **COLE, WILLIAM**.—"A chain pump, intirely upon a new construction, for raising water out of ships, or draining of lands, or for any other purpose where a chain pump can be applied or made of use." The chief points in its construction are the following:—There is a wheel consisting of two cast iron circular plates or rings fixed opposite each other by bolts passing through both so as to form the skeleton of a drum. This is mounted on a horizontal axis over a cistern on the deck, which cistern communicates with the hold by two cylindrical tubes of wood, and with the outside of the ship by means of the pump dale. The chain which passes over the drum is continuous, ascending in one tube and descending in the other, and is composed of flat links alternately double and single. On every fourth single link a flat circular saucer is fixed, consisting of middle plate of leather and an upper and lower plate rather smaller than the other, of cast iron. The lower portion of the tube for the ascending saucers is fixed between slides and is capable of being raised or lowered at pleasure.

[Printed, 6d. Drawing. See No. 911.]

A.D. 1771, May 28.—N° 990.

**WORTH, JOHN**.—"A preparation or cement for the purpose of preserving His Majesty's and others' ships and vessells from worms, &c., by the paying of their sides and bottoms, and for various purposes in agriculture and commerce, for preserving buildings, &c. made of wood," from the weather. The cement is prepared in the following way,--take of powdered rosin fourteen pounds; sand, sifted and washed, twenty-eight pounds; red lead, three pounds and a half; oil, one pound and three quarters. Melt the rosin over a moderate fire; put the sand and lead in by degrees, then put in your oil; when they are boiling, keep them constantly stirring till cold." Take of this "cement such quantity as may suit your purpose, broke into small pieces, and to every twelve pounds put in a bare half pound of oil; when melted, apply it to what you design, either by pouring it on or using it with a brush while boiling hot."

[Printed, 3d. No drawings. See Repertory of Arts, vol. 5, p. 177.]

A.D. 1771, July 18.—N<sup>o</sup> 994.

STOREY, JAMES.—“ A new machine for releaving of all ships  
 “ that are affected or troubled with water, and for other purposes,  
 “ by the help of a pump ” The drawings show four distinct  
 arrangements. The first, “ for raising water, grinding corn, work-  
 “ ing forge hammer, &c., ” is a lever, the shorter arm of which  
 raises water from a well, while the longer arm appears to be worked  
 in part or wholly by a water wheel attached to it, and driven by  
 the water raised from the well. Another “ for raising water  
 “ from ships mines, &c., ” is also a lever having an arrangement  
 for adding a weight to the longer arm, to balance the weight of the  
 bucket, raised by the shorter arm. A third drawing shews the  
 application of multiplying gear to the longer arm of a lever,  
 the shorter arm of which raises four buckets. The last arrange-  
 ment “ for drawing coals without horses ” consists of a pump for  
 raising water near the pit’s mouth for the purpose of filling a  
 bucket which is then allowed to descend into the pit and by its  
 gravity to raise a corf or bucket of coals attached to the other end  
 of a pulley.

[Printed, 9d. Drawings.]

A.D. 1772, April 30.—N<sup>o</sup> 1015.

VAN HAAKE, CHRISTIAN WILHEM, Baron —“ New-invented  
 “ secret art or mystery in extracting and making from a certain  
 “ mineral several compositions called mineral tar and mineral oil,  
 “ which I substitute instead of tar or liquid pitch intended and used  
 “ for the bottoms and other parts of ships and navigable vessels,  
 “ also vitriol, saltpetre, lampblack, and caput-mortuum, of the said  
 “ mineral.” These products are obtained in the following way:—  
 A “ quantity of such mineral or coal ” is placed in an iron cylinder.  
 To the fluid which issues from the cylinder when it is exposed to  
 heat is given the name of “ mineral tar.” From this extract water  
 is drained, which is “ thrown on loose ground, and let lye there  
 “ until it impregnates by the air, and when so impregnated I give  
 “ it the name of vitriol.” A portion of this water is put into an  
 air-tight hole dug for that purpose in the earth, and being allowed  
 to lie until it is “ impregnated,” it becomes “ saltpetre.” “ The  
 “ residuum dregs or dross remaining after I have made use of the  
 “ ‘ tar ’ is the ‘ caput-mortuum ’ ” To the deposition on the interior

of a vessel held over the cylinder in which the mineral is heated, so as to receive the smoke "I give the name of lampblack." And the said ingredients or different species of tar, vitriol, and saltpetre being all compounded in fit proportions, alone compose the liquid composition invented "by me" for preserving ships, vessels, and timber, "and by me called by the said name of mineral tar or " mineral oil."

[Printed, 3d. No drawings. Referred to in Rolls Chapel Reports, 6th Report, p. 162.]

A.D. 1773, April 1.—N<sup>o</sup> 1037.

HARTLEY, DAVID.—"A particular method of securing buildings " and ships against the calamities of fire." "By the application " of plates of metal and wire, varnished or unvarnished, to the " several parts of buildings and ships, so as to prevent the access " of fire and the current of air, securing the several joints by " doubling in, overlapping, soldering, rivetting, or in any other " manner closing them up, nailing, screwing, sewing, or in any " other manner fastening the said plates of metal in, to, and about " the several parts of buildings and ships, as the case may require."

[Printed, 3d. No drawings. See Repertory of Arts, vol. 8, p. 233; Webster's Reports, vol. 1, p. 54; Webster's Patent Law, p. 45 (also p. 126, case 26\*); and Henry Blackstone's Reports, vol. 2, p. 493.]

A.D. 1773, December 20.—N<sup>o</sup> 1058.

PICKERING, JOHN.—"A curious and new method of making " with paper ornaments for the inside and outside of buildings " and ships, and for all sorts of furniture, resembling wood carving, " though more beautiful and durable." Pasteboard prepared with hot size "made with white leather or parchment" is put under a die and pressed, by which means "a curious imbossment or figure" is obtained "with so fine a surface as can gild and burnish " thereon." Similar impressions of a simple kind are obtained more rapidly by means of a stamp hammer."

[Printed, 3d. No drawings.]

A.D. 1774, June 17.—N<sup>o</sup> 1072.

BLANCH, JOHN.—"An hydrostatick pump or engine on a new " construction, which will answer the purpose of a common pump, " and for extinguishing fire, watering roads, gardens, &c., and " will be very useful on board of ships as an head pump, which

" may be worked with much less strength, and will force more  
 " water, than any other engine now in use." The inventor describes  
 a force pump which is able by means of an air vessel to " force  
 " water fifty yards high in a constant stream." The piston is  
 raised by a rope or chain on the end of the lever or handle, and is  
 forced down by a spiral spring coiled between the upper side of  
 the piston and the cover on the top of the pump barrel.

[Printed, 6d. Drawings.]

A.D. 1774, November 17.—N° 1087.

PINTO, FRANCIS.—A " new-invented pump of a new construction  
 " and upon new principles, to be worked by fire, by means whereof  
 " water may be raised to any height and in any quantity occasion  
 " may require " Water is raised in this machine by the inter-  
 mittent application of flame or heated vapour to a receiver for  
 the purpose of creating periodically a partial vacuum in pipes  
 communicating with the receiver, and thereby causing the water  
 to ascend in them by pulsations.

[Printed 6d. Drawings. Referred to in Rolls Chapel Reports, 6th Report,  
 p. 139.]

A.D. 1775, November 22.—N° 1108.

MILLER, SAMUEL.—" An intire new wind machine which, from  
 " the simplicity of it's construction, may be put into actual  
 " operation in the space of a quarter of an hour, for the purposes  
 " of pumping water out of ships at sea; for adding velocity to a  
 " ship by means of skulls placed in the stern at those times  
 " when oars would be useless, and for loading and unloading  
 " goods into and out of all kinds of vessels."

The machine, which is erected on the after deck of the vessel,  
 consists of four arms or vanes in the same plane and at right  
 angles to each other, on each of which a triangular sail is set to  
 form a windmill. By means of systems of wheels, motion is com-  
 municated from it to two oars or sculls working out through the  
 stern, to a chain pump, and also to a hand pump.

[Printed, 6d. Drawings.]

A.D. 1779, May 26.—N° 1225.

NARBELL, ISAAC.—A certain bitumen, which " would be found  
 " an expeditious, durable, efficacious covering or sheathing for  
 " ships at war, and all other ships and shipping in all seasons and

“ climates;” “ a light covering thereof would also effectually prevent the staving and bursting of the casks containing water, beer, wines, and other liquors for the navy.” Also a “ composition called the ‘ Egyptian Mastic,’ which, being reduced from stone into a state of pliability for the trowell, might be laid on all timber buildings,” “ and may therefore be eminently serviceable in securing all our stores and warehouses and all other publick erections, and ” it “ will be equally useful in lining and stopping the outzings of water into ships decks.” The bitumen is composed of one hundred weight of “ yellow rosin,” “ fifty-six pounds of black rosin, two hundred ” “ weight of any white stone ground, and fifty-six pounds of lime,” melted together. It is to be laid on the surfaces to be preserved while in the fluid state, by means of a mop. The Egyptian Mastic for plastering is made as follows: Take one hundred weight “ of any white stone pulverized, two hundred ” “ weight of brick dust, twenty-eight pounds of quick stone lime ” for colouring the same, and one and a half hundredweights “ of plaister of Paris;” mix them into a paste with clean water and lay on with a trowell. To make a stiff mixture for use in moulds, &c., take the following proportions: “ one hundredweight, of any white stone pulverized, three hundred like weight of sand, one hundred said weight of grout of soap boilers, and one hundred said weight of clay of any kind.”

[Printed, 3d. No drawings. Referred to in Rolls Chapel Reports, 6th Report, p. 164.]

A.D. 1779, December 10.—N<sup>o</sup> 1240.

KEIR, JAMES.—“ A compound metal capable of being forged when red hot or when cold, more fit for the making of bolts, nails, and sheathing for ships than any metals heretofore used or applied for those purposes, and also for various other purposes ” where other metals have been used or applied. This compound metal consists of “ one hundred parts of copper, seventy-five parts of zinc or spelter, and ten parts of iron. When those proportions are well combined together, they constitute a compound metal, which may be forged either when cold or when heated to a blood red.” Although these proportions are the best, yet other proportions will be found to possess an inferior degree of these properties.

[Printed, 3d. No drawings. Referred to in Rolls Chapel Reports, 6th Report, p. 165.]

A.D. 1780, June 12. —N° 1256.

**DONNITHORNE, NICHOLAS, SHERSON, ROBERT, and SMITH, EDWARD** —“ A new white composition called marine metal, which will be found particularly useful for sheathing of ships and other valuable purposes.”

The composition is made in the following manner:—“ Take zinc (quantum placet), break it into small pieces, put it into an iron pan, on which invert another; then place on a sand heat and give it a roasting; remove it, and suddenly extinguish the heat in very strong lime water, about four pints to the pound weight of zinc.” Repeat this operation six times, then “ let the matter be taken out of the lime water and finely triturated.” Put it again into the lime water “ and evaporate gently over a moderate fire ” until it acquires the consistence of paste, adding by degrees of black soap one ounce, of salt of zinc one drachm “ to every pound of the zinc. Then, to make the composition, add to one hundredweight of molten tin ten pounds of the foregoing mixture, and let it fuse with a moderate fire.

Printed, 3*d*. No drawings. See Repertory of Arts, vol. 6, p. 305.]

A.D. 1782, January 14. —N° 1315.

**MORLEY, HILDEBRAND** “ Machine for unwatering or raising and discharging water out of the holds of ships, mines, and other places in great quantities, either spontaneously or by the assistance of a small force, and for working of mills upon the same principles, or for any other purpose requiring the like powers ” The inventor first describes a pump not applicable to ships, and worked by means of a head of water. The pump for raising water from the holds of ships is a force pump, the piston of which being heavily weighted is allowed to descend by the force of gravity, and is raised again by two ropes or chains attached to two wheels and axles fixed on the deck, and worked by hand

Printed, 8*d*. Drawings.]

A.D. 1782, May 2. —N° 1329.

**SAUNDERS, EDMUND** “ A new invented mixture or composition,” “ called naval black varnish, to be used in paying the yards, topmasts, bowsprits, bends, blocks, anchors, &c. of ships,

“ instead of tar and lamp black, which had been generally hitherto  
 “ used for those purposes.” The method of making the varnish  
 is as follows :—Distil Stockholm tar chemically as long as it will  
 bear running without catching fire. Then draw off the residuum  
 and put it into a furnace, adding as much of the oil produced by  
 the distillation as “ will bring it to the consistence of thin treacle.”  
 To this add “ black barrilla,” which is a mixture of tar and pitch  
 burned, and ivory black. “ It may be used in all weathers with-  
 “ out heating, with a painting brush.”

[Printed, 8d. No drawings. Referred to in Rolls Chapel Reports, 6th  
 Report, p. 166.]

A.D. 1783, July 29.—N° 1381.

FORBES, WILLIAM.—“ A method of manufacturing bolts and  
 “ other fastenings for ships, in a manner and of materials never  
 “ hitherto made use of for those purposes.” The bolts are made  
 of “ copper and spelter, zinck or lapis calaminaris in a proportion  
 “ of from one pound to sixty of spelter zinck or lapis calaminaris  
 “ to one hundred pounds of copper,” according to the degree of  
 hardness required. The metal is first drawn out into four sided  
 bars at a common rolling mill or by hammers. These four sided  
 bars are then made to pass through the grooves of two rollers in  
 contact with each other. By making the piece of metal pass  
 successively through the different grooves or holes in the same or  
 in different pairs of rollers, each groove or hole being less in  
 diameter than the preceding hole, it may be brought at last to the  
 required size. The mixed metal herein described must be rolled  
 cold ; pure copper may be rolled either hot or cold, according as  
 it is required to be more or less hard. “ Other fastenings for  
 “ ships called horse shoe and dovetail plates and keel staples are  
 “ made from a mixture of one hundred pounds of copper and any  
 “ quantity of spelter melted and mixed with it,” “ from one pound  
 “ to sixty pounds according as the metal is required to be more or  
 “ less hard.”

[Printed, 8d. Drawings.]

A.D. 1783, October 2.—N° 1388.

COLLINS, WILLIAM.—“ Making and preparing bolts used for  
 “ fastning the timbers of ships together, which bolts will not be  
 “ subject to the decay that has proved so fatal to those now in

" use. "The said bolts are made either of iron or pure copper." For the iron bolts, "take the finest iron, in square or other formed bars, and make them round, when hot, by means of dies and punches, commonly called swages." Then draw or force them cold through smooth steel holes of different sizes by means of two cylinders, which have grooves in them, and are made rough in order to take hold of the iron, and being both turned one way, drag the iron after them. When the iron has acquired sufficient hardness, it is cut into proper lengths and plated with sheet copper or metal, which is fixed to the iron "either with brass or spelter, tin or lead, alone, or" with mixtures of them. For copper bolts, draw out the ingots by the common means of hammering or rolling hot till they are reduced to a proper size. Then, "being first perfectly annealed and gradually cooled, they are from that size to be extended or lengthened cold to the sizes wanted," in the manner described for iron bolts.

[Printed, 5d. Drawings.]

A.D. 1784, January 16. N° 1413.

BECK, STEPHEN. Newly invented ship's hearth or stove, with copper and iron kettles, for the dressing of victuals on board of ships, whereby such victuals are not only more commodiously dressed, but much less fuel is consumed.

This patent was stopped by caveat, and did not pass the Great Seal till the 12th of August 1784. See N° 1463.

[No Specification enrolled.]

A.D. 1785, January 28—N° 1463.

BECK, STEPHEN — "A ship's hearth or stove, with copper and iron kettles, for the dressing of victuals on board of ships, whereby such victuals are not only more commodiously dressed, but much less fuel is consumed than in the common mode of dressing the like victuals." "The said machine, hearth, or stove, is designed to roast, bake, and boil at one and the same time, and by one and the same fire, by which a great saving is made in the article of fuel, and as the coppers or boilers are before the chimney and in the front of the machine, it can be used without having occasion to go round the same"

[Printed, 5d. Drawings.]

A.D. 1785, November 2.—N° 1502.

**LUKIN, LIONEL.**—"An improvement in the construction of  
"boats and small vessells, for either sailing or rowing, which will  
"neither upset in violent gales nor sudden gusts of wind, nor  
"sink if they should by any accident be filled with water." The  
invention is as follows:—"To the outsides of boats and vessells of  
"the common or any other form, are projecting gunnels slopeing  
"from the top of the common gunnell in a faint curve towards  
"the water, so as not to interrupt the oars in rowing, and from  
"the extreme projection (which may be greater or less according  
"to the size and use the boat or vessell is intended for) returns  
"to the side in a faint curve, at a proper distance above the water  
"line. These projecting gunnels may be made solid, of any light  
"materials that will repel the water, or hollow and water-tight, or  
"of cork, and covered with thin wood, canvas, leather, tin, or any  
"other light metal, mixture, or composition." The spaces under  
the seats, &c. of boats are made water-tight or filled with cork,  
and a metal false keel is fitted.

[Printed, 3d. No drawings. See Repertory of Arts, vol. 3, p. 10; and Rolls  
Chapel Reports, 6th Report, p. 172.]

A.D. 1786, March 4.—N° 1536.

**BUTLER, JOHN.**—"A new method of making bolts and brazier  
"or other rods of or from iron, copper, or brass, or iron shearings,  
"for ships or other purposes, upon a new principle," as follows:—  
Two reverberatory air furnaces are to be provided, "heated with  
"pitt coals, one capable of producing a welding heat, the other a  
"more moderate heat; and a pair of cast iron rolls," in which  
grooves of different dimensions must be cut. "The shearings of  
"iron or other mettall must be tied up with iron or other metal  
"bands in bundles, something larger than the largest groove, and  
"put into the welding furnace, where they are to remain until a  
"welding heat is obtained, and then taken out and run through  
"the largest groove twice or oftner, untill a bolt is formed, and  
"then through the next smaller grooves while the heat continues."  
"The bolts are then put into the second furnace, and moderately  
"heated, and run through the yet smaller grooves untill they are  
"reduced to the size required." "Bar iron, brass, or copper are  
"only put into the furnace which gives the moderate heat, and

“ run through such of the grooves as are nearest the size of the piece to be rolled and reduced.”

[Printed, 3d. No drawings. Referred to in Rolls Chapel Reports, 6th Report, p. 173.]

A.D. 1786, August 5.—N<sup>o</sup> 1552.

**SKIDMORE, JOHN** —“ New method of ornamenting ” the insides of houses and ships, &c. with any or every kind of “ stone, glass, and composition used in or applicable to the jewellery trade ” The insides of ships are to be ornamented “ by drilling, punching, stumping, pressing, rolling, cutting, or by any other method of making shallow or deep holes or grooves ” in the surfaces, “ according to such form, pattern, device, design, or shape, as the ornament intended to be made is to be,” and then by fixing or setting “ in such shallow or deep holes or grooves ” with any sort of strong sticking varnish, or any kind of cement “ or gummy substance that will become hard,” “ foil stones, Bristol stones, paste stones, pinched glass, lapped glass, or any other stone, glass, or composition.”

[Printed, 4d. No drawings. Referred to in Rolls Chapel Reports, 6th Report, p. 173.]

A.D. 1787, August 28.—N<sup>o</sup> 1620.

**MITCHELL, THOMAS**. —“ A new method of raising water and other fluids for the purpose of driving mills and other machines and watering lands, also for draining lands, and pumping or clearing water from ships, and for extinguishing fires in houses, and other useful purposes.”

The invention for raising water and other fluids consists in the following particulars ; —

First, in rarefying “ the air with fire or ignited substances in a close vessel above water or other fluids, and above a conducting pipe or tube placed between them, with a valve at the upper end of the tube opening into the air vessel, whither the atmosphere will press and rush up the fluid, and where it will stand till it be discharged for any useful purpose.”

Secondly, in forming a hand pump, as follows :—Take the barrel of a hand pump of any “ matter, form, or size fit for the purpose,” having two covers upon its upper end near to each other, “ the undermost to be as solid as may be necessary, and the

“ uppermost to have a collar of leather around the opening for a  
 “ piston, with brims for holding water, to keep this opening air-  
 “ tight.” “ Hang a solid piston without a valve through the  
 “ covers into the barrel,” having its lower end terminating in a  
 conical or pyramidal form; and let the piston reach down no  
 further in working than to the half of the barrel.

[Printed, 6d. Drawings. Referred to in Rolls Chapel Reports, 6th Report, page 177.]

A.D. 1788, May 23.—N° 1651.

FULTON, WILLIAM.—“ A new method or art of using and  
 “ working pumps as well on board of ships as on land, rubbing  
 “ boards used in bleaching, and all other mechanical machines or  
 “ engines of similar natures or constructions by means of a cylinder  
 “ with its appur̄ts.” A cylinder turned by hand or by other means  
 has a continuous groove on its surface, so cut that a vertical bar or  
 pendulum lever suspended over it, and having a pin or roller in its  
 lower end, fitting into the groove, may be made to oscillate. This  
 motion is produced by the passage of the pin or roller, and there-  
 fore of the lower end of the lever, from end to end of the cylinder,  
 as the pin or roller is carried along the groove by the revolution of  
 the cylinder about a horizontal axis. The motion of the lever may  
 be communicated to a beam working two pumps, a vertical pump  
 rod being attached at each end; to a pump handle working a  
 single pump; or, in a similar manner, to other machinery.

[Printed, 7d. Drawings. See Repertory of Arts, vol. 3, p. 220; and Rolls Chapel Reports, 6th Report, p. 179.]

A.D. 1788, August 12.—N° 1662.

DUCREST, CHARLES LEWIS.—“ Making paper for the building  
 “ of houses, bridges, ships, boats, and all sorts of wheel carriages,  
 “ sedan chairs, chairs, tables, and book cases, either intirely of  
 “ paper, or wood and iron covered with paper.” By this invention  
 the hulls of boats “ are made on a mould which is covered all  
 “ over with canvas, upon which several layers of paper are pasted  
 “ one above another until the necessary strength is acquired; the  
 “ mould is then disjointed and taken out and the canvas taken  
 “ from the paper, leaving the body of the” boat “ of paper only,  
 “ and in one intire piece.” After this “ the bends, benches, and  
 “ supporters are made of white wood, and all enveloped with  
 “ several layers of paper pasted one upon another until of suffi-

“cient strength, which layers of paper are also extended all over  
 “the boat, within and without, so as to give it the appearance of  
 “one entire composition of paper. Larger vessels are first con-  
 “structed of thin light wood, layers of paper are pasted thereon  
 “as well within as without in such manner as to give the vessel  
 “the appearance of an intire composition of paper;” two coats  
 of hard mastic are then apphed to the inside of the vessel and  
 four to the outside, and the better to guard the outside from the  
 shock of extraneous bodies it is sheathed with sheets of copper  
 a little thicker than those generally used for sheathing of vessels.

[Printed, 4d. No drawings. Referred to in Rolls Chapel Reports, 6th  
 Report, p. 179.]

A.D. 1789, May 12.—N° 1681.

WHITE, WILLIAM. “A machine by him invented by which  
 “the noxious or foul air may be expelled in a short interval of  
 “time from any mine, ship,” gaol, “hospital, chamber, or other  
 “close place, and fresh cool air introduced in its stead, however  
 “calm the atmosphere, or however warm or sultry the season or  
 “climate.” This machine consists of a fan or blower working in  
 a drum and driven by hand, by means of a strap or band passing  
 over a fly wheel and over a small wheel on the axis of the fan.  
 The air enters at a circular aperture round the axis of the drum,  
 and is driven out at the side through a set of tubes in any re-  
 quired direction. If it is desired to draw foul air from the hold  
 a pipe is led up therefrom to the aperture by which the drum is  
 supplied. The fan is divided into two parts by a partition, that  
 foul or fresh air may be sent forward at the same time by different  
 pipes.

[Printed, 9d. Drawings. Referred to in Rolls Chapel Reports, 6th Report,  
 p. 180.]

A.D. 1789, October 29.—N° 1705.

WHITMORE, WILLIAM.—“A new invention of pumping ships  
 “and vessels under way by means of wheels and other machinery,  
 “without manual labour.” This operation is to be performed as  
 follows—A wheel is to be affixed to the side of the ship or vessel,  
 “which wheel, being wholly or partly immersed in the water, is  
 “forced round on its axis by means of the resistance given by the  
 “water to the ship’s or vessel’s way therein,” and the motion so

acquired is communicated from the said wheel by means of cog wheels and other apparatus “to the cylinders or tubes usually  
“ employed in ships or vessels, according to the common method  
“ of pumping, from whence the water contained in the ship’s  
“ hold is discharged in the common and usual manner.” The wheel may be shipped or unshipped at pleasure, and is made to reef.

[Printed, 5d. Drawings.]

A.D. 1789.—December 12.—Nº 1718.

DELOLME, JOHN LEWIS.—“ A vessel which, without any  
“ danger of oversetting, can sail faster and keep a truer course in  
“ every direction of the wind than other vessels now used at sea  
“ can do; secondly, the vessel can be veered about and brought  
“ to opposite tacks with more speed, and through a shorter com-  
“ pass, than other vessels are able to be; thirdly, the sail is hung  
“ in such a manner, and the upper parts of the vessel are made of  
“ such a shape, as farther assist the vessel in fast sailing in diffi-  
“ cult directions of the wind; fourthly, the rudder is made to sink  
“ deeply into the water, by which the manageableness of the  
“ vessel is farther increased, and at the same time the rudder is  
“ very solidly fixed; fifthly, by having its body diminished under  
“ the water the vessel affords an easier landing than can be  
“ effected with the boats or veseels in use on the sea coasts.”  
The vessel has a mass of metal suspended from its sides by long stiff rods at a considerable distance below the surface of the water, to act as ballast. It has also a very deep keel hung on hinges, and a rudder so suspended as to be capable of extending considerably below the bottom of the boat. Ballast, keel, and rudder can be raised at pleasure. The bottom of the vessel and its sides are flat, the sides being either vertical or having an inclination inwards. The invention also refers to a peculiar form of sail.

[Printed, 11d. Drawings.]

A.D. 1790, March 13.—Nº 1732.

STANHOPE, CHARLES, EARL.—“ A method of constructing  
“ ships and vessels, and of moving and conducting them with  
“ great velocity without the help of sails, and also moving and  
“ conducting them against wind, waves, current, or tide, or against  
“ the power of them all united.” The invention consists, “first,  
No. 19. c

" in the shape of the ship or vessel; secondly, in the manner of  
 " guiding it; and thirdly, in the mechanism for moving the ship  
 " or vessel." The shape of the vessel is determined by the two  
 horizontal sections, one at the deck, and the other at the bottom,  
 which is flat. To construct these sections, the position of the  
 greatest breadth being chosen, and the proportion between length  
 and breadth, an arc of a circle is swept on each side the middle  
 line, enclosing a space equal to the greatest breadth, and lines are  
 drawn touching these arcs, and meeting at the ends of the vessel.  
 These tangent lines are shown straight, but they may be slightly  
 convex or concave. The section at the bottom is narrower than  
 that at the deck, and the side between them is straight from the  
 gunwale to the bottom. A straight part may be introduced  
 between the fore and after bodies if it is thought desirable. The  
 rudder is a rectangular board or plate working below the keel. It  
 is suspended by a vertical rod passing through its middle, in order  
 that it may " have an equal or nearly an equal pressure from the  
 " water on both sides of its stem or axis, by which contrivance  
 " the pilot may move the rudder or hold it in any required posi-  
 " tion, with much the greater ease." The velocity of the vessel  
 may be checked at any time " by turning the rudder till it be  
 " brought into a position directly across " the course.

Arrangements for propelling are also described.

[Printed, 1s. 6d. Drawings. Referred to in Rolls Chapel Reports, 5th  
 Report, p. 182.]

A.D. 1790, October 29.—N<sup>o</sup> 1779.

LUSCOMBE, MATTHEW.—" A new improvement on a compo-  
 " sition called naval black varnish, for paying yards, masts,  
 " blocks, and bends, anchors, &c. of ships, and which improve-  
 " ment is stated to serve in a very superior degree for the above  
 " purposes, and also for ships' bottoms, and for laying on copper  
 " for sheathing of ships, much better than anything hitherto  
 " known, and the oil extracted in the process is represented to  
 " be of great use to preserve the health of man on board ships  
 " and in hospitals, and in any situations, by purifying the air."

In a still capable of containing about nine hundred gallons, " I  
 " place as much thin iron as it will conveniently hold, with eleven  
 " to fourteen barrels of choice Stockholm tar, and about four  
 " hundred and thirty gallons of oil of tar; thus prepared, the

“ distillation is begun, and the first day from sixty to one hundred gallons of the fine oil mentioned in the Patent is extracted, and so on from day to day until the varnish be a fine japan black in colour and in size for masts, yards, &c., of fine thin tar for bottoms, &c., until it be as stout, when cold, as you can just penetrate with your finger. If it be found, after it is brought to a proper size, that it be not sufficiently black, from not having imbibed a proper quantity of iron,” more oil of tar must be put in the still and the process continued, until it becomes perfectly black.

[Printed, 2d. No drawings. See No. 1829.]

A.D. 1791, February 24.—N<sup>o</sup> 1793.

ASHTON, ISAAC.—“ A method to sustain or resist the weight or pressure of solids and fluids in any lateral or antivertical direction.” The intention of this invention is to apply an arch antivertically,” “ in keels of ships, barges, and other vessels’ bottoms.” The drawings show straight pieces of timber worked longitudinally in short lengths over the floors and between strong vertical pillars ; the piece between every two pillars is called an arch, and is to “ prevent the keel from creaking.”

[Printed, 1s. Drawings.]

A.D. 1791, May 2.—N<sup>o</sup> 1802.

MURDOCK, WILLIAM.—“ The art or method of making (from the same materials and by processes entirely new) copperas, vitroil, and different sorts of dye or dying stuff, paints, and colours, and also a composition for preserving the bottoms of all kinds of vessells, and all wood required to be immersed in water, from worms, weeds, barnacles, and every other foulness which usually does or may adhere thereto.” The operations are as follows:—Take any quantity of ores of arsenic and sulphur, called pyrites, and add thereto about one-sixth part of “ the ores of zink,” put the same into a kiln, house, oven, cone or heap, covered nearly close, and then set the same on fire, admitting no more air than is sufficient to cause the said minerals or ores to burn, the fume or smoke of which must be conducted into a receiver, in which receiver the smoke is condensed and “ produces a fine yellow powder, fit for painting, dying, and paying, and preserving ships’ bottoms, and all wood immersed in water.” By increasing or lessening the quantity of “ ores of zink ” added to the pyrites, various tints in the said yellow powder will be

produced. To make green vitriol or copperas, take any quantity of the remains of the above calcined ores or minerals, after the same are burned, and wash them in water and then evaporate the water by heat "to a chrystalizing point, and let the same stand "for twenty-four hours or longer, and chrystals of copperas or "green vitriol will thereby be produced."

[Printed, 3d. No drawings. See Repertory of Arts, vol. 9, p. 97.]

A.D. 1792, December 20.—N° 1926.

**COLLINS, WILLIAM.**—"A new kind of metal sheets and fast-  
"nings for sheets intended for the sheathing ships, as also the  
"rudder furniture, commonly called ships' rudder braces and  
"pintles." The cakes of copper, after having been well refined,  
are annealed, rolled, and pickled several times. The sheets being  
then made "perfectly clean, and free from every impurity that can  
"injure or blemish them, and each containing the breadth of two  
"finished sheets, are doubled lengthways, passed cold between  
"iron, steel, or hard brass rolls highly polished, till they are  
"pressed out to the full length required. By this operation they  
"acquire a superior degree of firmness, a bright and even polish,  
"as well as an exactly equal substance throughout." To make  
the improved sheathing nails, take square wire made from sheets  
or plates of pure copper; let this be drawn to the size of the nail  
required, and left hard; then cut it by a gauge into the length  
proper for each nail, making an allowance for the head, and form  
the point with a hammer. Put each of these pieces into "a pair  
"of clams prepared to fit and receive it diagonally, save so much  
"as was left to form the head of the nail, which is finished by  
"beating it down with a hammer into a countersunk form made  
"to receive it at the top of the clams." Or let strips of copper  
be passed cold between properly formed rollers, to give the desired  
shape down to the point; then, to form the head, proceed as  
before. The improved pintles and braces are made of pure copper,  
the hole in the brace to receive the pintle having a brass bush in  
it, and the pintle itself being covered by a brass case or tube.

[Printed, 5d. Drawings.]

A.D. 1794, June 2 —N° 1994.

**FITZGERALD, WILLIAM.** An apparatus by which ships and  
vessels may be discharged of water "by means of their own

“ motion, and which is also useful and applicable to very many  
 “ purposes in pneumatics, hydrostatics, and hydraulics.” In this  
 invention the upper part of the body of the pump branches off  
 into two upright barrels, with a sufficient interval between them to  
 admit two cylinders, one attached to and communicating with  
 each barrel and with their axes in the same horizontal straight  
 line. These two cylinders have a common piston rod, to which a  
 reciprocating motion is given, by hand, by the swinging of a pen-  
 dulum from side to side, as the ship rolls, or by the action of an  
 instrument constructed with oblique vanes, and towed behind the  
 vessel. The rotary motion of this instrument is communicated to  
 the rope by which it is towed, and thus, by the intervention of  
 suitable gear, to the pump. The inventor also describes a modifi-  
 cation of this invention applicable to mines, the vanes being  
 turned by the wind.

[Printed, 2s. 7d. Drawings.]

A.D. 1795, October 15.—N<sup>o</sup> 2068.

WILSON, CHRISTOPHER.—“ A new method of combining tim-  
 “ bers, applicable to the improvement of naval architecture and  
 “ all ponderous and large works composed of wood.” To combine  
 any number of pieces together according to this invention, “ dove-  
 “ tail or plain mortises are to be cut of a diagonal or inclined  
 “ direction ” across the faying surfaces, half the mortise being  
 taken out of each piece. Then the pieces being brought together,  
 “ a dove-tail or plain slott, lock, or bolt, made of wood, is to be  
 “ driven tight through each mortise.” At the extremity of each  
 slott, lock, or bolt, fox wedges, made of wood or metal, may be  
 driven where deemed necessary. “ By this method numerous  
 “ timbers may in like manner be combined according and in pro-  
 “ portion to the thickness and strength required, the same slott,  
 “ lock, or bolt, in every instance, being made to pass diagonally  
 “ through the diameter of the whole.” “ The same method of  
 “ driving slots, locks, or bolts diagonally into mortises may be  
 “ practiced with great advantage between the ribs, timbers, or  
 “ frames of ships (either in building or repairing);” and likewise  
 in every other part of shipping and other large and ponderous  
 works composed of wood, where strength and durability are  
 required.

[Printed, 9d. Drawings. See Repertory of Arts, vol. 9, p. 100.]

A.D. 1796, March 8.—N° 2097.

**BUCHANAN, ROBERTSON.**—"A pump, upon an improved construction, for raising water in various situations, but more particularly on board ships, and which may occasionally be converted into an engine for extinguishing fire; is not liable to choak or go out of repair, being so constructed as to prevent gravel, dirt, or other things from causing an unnecessary tear and wear of the parts, or from lodging in it, and having its valves so situated as to be within the command of a person's hand, without taking any part of it asunder; may be worked by any of the methods practised in working the common pump, and is capable of raising a greater quantity of water, with an equal given force, than any other machine for the purpose hitherto invented." "The water is discharged from this pump through two valves, the one called the inner valve, situated on the bore of the suction piece, through which the water, on raising up the piston, first passes, and from thence is communicated, by means of an aperture in the side of the pipe, to the second or outer valve, which is placed at the bottom of the cistern, from whence it passes into the spout." The outer valve is not only within the command of a person's hand, but is made so as to afford a communication to clear the inner valve. These valves are made large enough to admit any body or substance through them that is capable of passing through the suction pipe. From their size and situation they may be at all times easily taken out. When the pump is required to be used as an engine for extinguishing fire, it is only necessary to make the piston air-tight in descending as well as in ascending, and to fix to the cistern an air vessel communicating with the pipes.

[Printed, 7d. Drawings. See Repertory of Arts, vol. 5, p. 236.]

A.D. 1796, March 17.—N° 2099.

**WOODS, WILLIAM.**—A "new invented and improved hand pump for raising water out of ships and other places, by which a greater quantity of water can be raised in less time than by any other pump." This is a suction pump, the body of which lies below the deck, a flange at its upper part being screwed down to the deck. The water either flows over on the deck or a head may be screwed on, that it may be led away by a hose or shoot. The pump rod or tongs is attached to the spear by a bolt passing

through both at their lower ends, the spear being compelled to move vertically by a guide attached to the stanchion. The stanchion steps into the deck near the pump, and the brake works over its head, the long arm of the brake having an elongated ring shape, that several men may be employed together in working it. The secondary advantages sought by this arrangement are readiness of removal, and (by keeping it below the deck) less exposure to injury by shot than usual.

[Printed, 8d. Drawings. See Repertory of Arts, vol. 10, p. 331.]

A.D. 1796, May 3.—N° 2106.

MILLER, PATRICK.—“A vessel of a new construction, which  
 “ draws less water than any other vessel of the same dimensions,  
 “ which cannot founder at sea, and which is put in motion in  
 “ calms and light winds by a method never before practised.”  
 “ The said vessel is kept afloat, without the aid of its sides, solely  
 “ by the buoyancy of its bottom, which is flat, the bottom never  
 “ being so deeply immersed as to bring the upper surface thereof  
 “ on a level with the water, such vessels not being constructed for  
 “ the purpose of carrying cargoes, but for that of carrying  
 “ passengers, with the necessary stores and provisions.” It is  
 put in motion during calms and against light winds by means of  
 wheels; “ these wheels project beyond the sides of the vessel, and  
 “ are wrought by means of capsterns.” Sliding keels are used to  
 keep the vessel to windward when under sail. “ Vessels of this  
 “ construction draw water in proportion to their dimensions, as  
 “ follows :—A vessel of forty feet in length, and from thirteen to  
 “ nineteen feet in breadth, will draw from thirteen to sixteen inches  
 “ of water,” and “ one of one hundred feet in length, and from  
 “ thirty-three to forty-seven feet in breadth, will draw from thirty  
 “ to thirty-three inches of water.

[Printed, 8d. No drawings. See Repertory of Arts, vol. 6, p. 18.]

A.D. 1797, August 17.—N° 2190.

ECKHARDT, ANTHONY GEORGE.—“An improved method of  
 “ constructing pumps and engines for evacuating water or other  
 “ fluids, extinguishing of fires, and producing power.” The  
 object of the inventor in the several kinds of pumps described by  
 him is chiefly to “obtain a more abundant and easy supply of

"water to" the "pistons." This he does in the pump designed for use in ships by fixing on each side of the horizontal barrel of the pump a horizontal cylinder of the same length as the barrel. He then places an air-tight cover across the ends of these three hollow vessels, leaving an open space so that there may be a horizontal channel formed quite round the barrel by means of the two cylinders and these open spaces. The side of one of these cylinders receives the supply pipe, and to the side of the other the discharge pipe is fixed. The piston is a square block of metal with rounded ends made to slide in the (square) barrel "as neat and perfect as is possible;" the rod passes quite through the pump and is drawn forward at each end alternately. When a partial vacuum is formed by the motion of this piston, the water opens the valves disposed round the channel, and flowing in at the side of one cylinder passes out from the side of the other. The body of the pump being securely fixed on the deck of the ship, with the piston rod athwartships and horizontal, a trough running on wheels and loaded with ballast is attached to each end of the rod, so that it may run in and out as the ship rolls, and thus work the pump.

*Drawn in the Drawing.*

A.D. 1797, October 31.—N<sup>o</sup> 2197.

HARRIOTT, JOHN.—"A cog-wheel crab or capstan, with geers  
" to work ships' pumps, engines, and hydraulic machines, and in  
" the way of working the pumps, engines, or machines, to give a  
" ship way through the water in calms or light winds."

The capstan, to be made of wood, iron, or other metal, is fixed in one of the decks its spindle being vertical. On this spindle is to be fixed a "cog wheel" working a pinion wheel fitted to an axle with cranks that will work one or more pumps as wanted;  
" the size of the rack and pinion wheels to be according to the  
" number of strokes intended to be given to the pumps by every  
" revolution of the capstan." If the well where the pumps are  
" situated is not five or six feet in diameter eight pumps or more may be worked  
" together or it should be separately. By adding the other requisite  
" parts of a complete capstan, it may be used as such for the ordinary  
" purposes of the vessel, as well as for working the pumps either  
" above or below the water, or when  
" the vessel's motion through the water, or when

lying in a current, a long axle reaches from the capstan to a water wheel, the arms or paddles of which dip in the water. This is put in motion by the vessel's way through the water, which working the capstan wheel, the capstan then works the pumps without the assistance of men. "Geers or double-handled levers" may be made to work two pumps independent of the capstan. The inventor also describes a means of propelling vessels by means of these pumps.

[Printed, 6d. Drawings.]

A.D. 1797, December 23.—N° 2206.

MILTON, WILLIAM.—"A method of causing ships, [vessels, " barges, boats, and craft of all sizes which navigate either seas, " rivers, or canals to be built at prices considerably below what " are given for them as built in the present modes, and for rendering " the rudder thereof in some cases more effectual." The principle of the invention consists "in making a vessel or boat which shall " be of easier construction and simpler figure, sail as well in all " relations to the wind, and endure as completely every " violence " of the sea as the more complex and curved forms hitherto in " use now do, and that by means of terminating the body of the " vessel or boat " by a "submerged head or tail." These appendages may be boxed up or open, solid or hollow, may be of different forms, materials, and surface, and may be fixed in a great variety of ways to a vessel or boat, according to the judgment of the builder. The proposed rudder is a kind of oar working in a trunk through the appended part of the boat; this trunk is broad at the top and tapers sideways to the bottom, where the rudder is pivotted, the blade or broad part lying wholly below the bottom of the boat. It is turned by a tiller, and may be hauled over from side to side in the trunk by tackles as the boat inclines, so as to keep it always vertical. If necessary, more than one such rudder may be used. As an improvement in caulking, it is proposed that one edge of every plank towards the middle of that edge should have a groove of convenient depth ploughed in it; that the groove be filled with hemp loosely twisted and charged with any unctuous or tarry matters; and that this edge be then laid against the grooved or ungrooved edge or side of the next plank.

[Printed, 6d. Drawings.]

A.D. 1798, February 28.—N° 2217.

**TAYLOR, WALTER.**—"A considerable improvement in the construction of machines for raising water in and for clearing ships of the same." The inventor describes a machine for raising water, consisting of tubes or trunks or buckets made of wood or metal; the outer trunk to be made of plank, and to have an inside tube, or trunk, or bucket made to pass freely up and down within it. In the bottom of the said inner tube, trunk, or bucket a valve is to be placed, in order that when it is lowered or let down within the outer tube or trunk the water may pass freely into the same, and that when the said inner tube, trunk, or bucket is drawn up, the valve or valves may be shut by the water till it is brought to the upper part of the outer tube or trunk to be delivered; two or more of these tubes or trunks being placed near or convenient to each other act in conjunction, so as to make a constant stream. These inner tubes are assisted in their operation by having leather or any other spongy substance fastened upon them so as to press close to the inner parts of the outer tube or trunk, "in order to make a vacuum as it descends." The inventor also describes a cowl for chimnies.

[Printed, 3d. No drawings. Referred to in Rolls Chapel Reports, 6th Report, p. 146.]

A.D. 1798, June 8.—N° 2242.

**BOSQUET, АБРААМ.**—"A certain important method, by the application of which His Majesty's navy, and all trading vessels" "may derive durability and soundness to a much greater length of time than they now do, and also a sweetness, staunchness, and perhaps a total exemption from bilge water, small leakage, and foul air," "besides an exemption from rats, and whereby the expence and necessity of caulking will be materially obviated, if not rendered altogether unnecessary; and also the expenditure and waste of an immense quantity of timber saved to this country both in building and repairing ships."

This invention consists in "occupying or filling up the void spaces between the planks, lining, and timbers of the ship to which the planks are bound with hot or melted pitch, tempered, as far as found necessary, with a due yet small proportion of tar, common glue, bees' wax, and tragacanth." There "is to be

“ mixed therewith a certain portion of cork shavings and small  
 “ bits of waste cork wood, &c. ;” “ and in those parts where the  
 “ timbers are remote from each other, pieces of cork, wood, or  
 “ slips of deal may be introduced which will render the less pitch,  
 “ &c. necessary.” To apply this composition a few planks of  
 the lining are bound to the timbers to the height of about three  
 feet all round ; the composition is then to be poured in. “ Thus  
 “ much being done, four or five feet more of the lining may be put  
 “ up all round, and the composition poured in as before, and so  
 “ on till all is complete to the necessary height.” Ships already  
 built “ may be saturated ” by ripping off a plank at successive  
 stages and proceeding as above.

[Printed, 4d. No drawings. See Repertory of Arts, vol. 9, p. 381 ; and  
 Rolls Chapel Reports, 6th Report, p. 193.]

A.D. 1798, August 23.—N° 2260.

DODGSON, GEORGE.—“ Certain pumps and engines for raising  
 “ and evacuating water or other fluids, and for producing  
 “ power,” “ peculiarly adapted for the use of ships and vessels.”  
 The different pumps described by the inventor are contrived upon  
 the same principle, namely, “ having each two or more working  
 “ chambers fixed to one suction pipe, for the purpose of raising or  
 “ forcing water or other fluids, and fitted with proper geer made  
 “ of wood, metal, or compound of metals, or any materials suit-  
 “ able to such or any purpose to which the said pumps may be  
 “ applied, and may be worked by the power of fluids, wind,  
 “ gravity, or animal or manual labour, or by its own production.”

[Printed, 5d. Drawings.]

A.D. 1800, February 1.—N° 2369.

PARKINSON, THOMAS.—“ An hydrostatic engine or machine,  
 “ for the purpose of drawing beer or any other liquors out of a  
 “ cellar or vault in a public house,” which engine or machine “ is  
 “ likewise intended to be applied for raising water out of mines,  
 “ ships, wells, or for any other purposes where fluids are required  
 “ to be raised.” The principal works of this engine or machine  
 are contained in an air-tight case or enclosure of various shapes  
 and dimensions. It has “ one or more cylinders and pistons, with  
 “ a rod or rods rising out of the air-tight case, which cylinder or  
 “ cylinders are fixt to what I call a stand pipe or pipes by means

" of screw joints;" " which stand pipes lead to smaller pipes that  
 " are fixt thereto in the same manner." For bringing the fluid  
 from casks, &c., at a greater or lesser distance, two valves are  
 placed in the case, one to allow the air to escape as the fluid rises  
 in it, and the other, " the receiving valve," to open and admit the  
 air while the fluid is running, and thus to assist in producing a  
 " continued stream without pulsations."

[Printed, 6d. Drawings.]

A.D. 1800, April 23.—N° 2390.

**COLLINS, WILLIAM.**—" A preparation or application of sundry  
 " articles and materials to be used chiefly for the preservation of  
 " shipping or marine purposes." The invention consists in the  
 application of various known " metallic or semi-metallic com-  
 " pounds to a purpose to which they have not been before  
 " applied," viz., to the sheathing of ships. The three classes into  
 which the inventor divides these compounds " may be called red,  
 " yellow, and white sheathing." For the first, eight parts of  
 copper to one part zinc is a good composition; this may be rolled  
 cold. For the second, 100 parts of copper and 24 of zinc are pre-  
 ferred; in this case a low red heat is necessary for working. For  
 the third or white sheathing, " sixteen parts tin, sixteen parts zinc,  
 " and one part copper form a good mixture." This must be cast  
 into plates. The inventor also claims " the application of metals or  
 " metallic mixtures as a substitute for iron in the several parts of  
 " the chains and saucers of the chain pumps usually called Cole's  
 " chain pump;" " the application of leather rings, either edge-  
 " wise or dished, as a substitute for the flat pieces of leather  
 " hitherto applied to the saucers of chain pumps;" the construc-  
 tion of the " working tube or chamber of metal, in lieu of wood  
 " and metal;" and the use of a " circular bottom " " in lieu of  
 " the iron roller hitherto employed." An arrangement is also  
 made for enabling the improved chain pump to serve the purpose  
 of a small pump, so that it may be worked by one, two, or more  
 men, as circumstances may require.

[Printed, 3d. No drawings. See Repertory of Arts, vol. 14, p. 87; and Rolls  
 Chapel Reports, 6th Report, p. 140.]

A.D. 1800, December 12.—N° 2455.

**PLAYFAIR, WILLIAM, and LE FAVRE, NICHOLAS.**—" New  
 " invention or improvement in naval architecture, whereby

“ vessels of all burthens may be enabled to sail faster than they  
“ now do, particularly in a heavy sea.” The object of this invention is to ward off from the bow or other part of the ship or vessel those waves which, “ by their sudden shock or resistance tend to  
“ impede its progress.” This is to be effected by interposing between the side of the ship or vessel and the wave a shield, on  
“ springs or some elastic substance.” “The said water shield  
“ may be either made of a solid body itself, on or with springs  
“ interposed, or perforated, or made otherwise, so as to allow  
“ water to pass thereby dispersing the wave, at the same time  
“ that it yields to its diminished impulse.” The shield is attached to the side above the load water line, and may either be secured permanently, or lashed temporarily at convenient positions by ropes passing through holes in the side.

[Printed, 7d. Drawings.]

A.D. 1802, May 20.—N<sup>o</sup> 2621.

BOSWELL, JOHN WHITLEY.—“ New method of building or  
“ fabricating ships or vessels for navigation.” The new method of building or constructing vessels “ differs principally from the  
“ old method in the placing timbers or ribs lengthways or horizontally instead of vertically,” and in using a framing consisting of a series of triangles, so as to produce a greater strength with the same quantity of materials, “ by which it is expected much  
“ less crooked timber need be used than is now employed.” The inventor proposes to reduce the number of transverse frames in a ship very greatly, having in some cases not more than four. These frames are formed of two or three ranges of futtocks close jointed and bolted together. The beams are attached to them at their proper heights, and stays are put across them, “ so as to divide the  
“ whole of the internal space or plane of the frames into triangles.” The horizontal ribs are then worked of curved timber of deep moulding, close jointed, or with the ordinary spaces between ribs, or with occasional larger intervals trussed with diagonal timbers. Vertical planking is to be wrought over this within and without, the latter being afterwards sheathed with horizontal boards if it is thought necessary. The outside planking is to pass between the bottom ribs and the keel where the form of the vessel will admit of it. When a vessel is wanted of so large a size that it will require plank of such a great thickness as could not be bent in a

"vertical position" without great labour and expense, the horizontal ribs may have large intervals left between them, and be made much thicker, the diagonal pieces are to be firmly fixed in the intervals, small vertical ribs are to be fastened over the horizontal ribs and over them, fore and aft planking is to be worked. The sides of vessels are to be formed of beams or pieces of timber similar to the ribs laid lengthwise over the upper part of the transverse frames, with intervals between each pair, across which intervals other pieces should be laid diagonally from frame to frame; smaller pieces should then be either placed across the direction of the beams, and let into the substance thereof, over which the planking should be laid lengthways, or else the smaller pieces should be laid in the direction of the beams from frame to frame, over or let into the diagonal pieces, across which the planking should be laid at right angles to the direction of the beams."

For the purpose of assisting the caulking the planks may be grooved at their edges, so that when the planks are put together the grooves may be opposite each other, and that narrow slips of durable wood may be placed in the grooves so as to lie across the seams the whole length of the planks, sufficient space being left outside them for caulking.

[Printed, 8d. Drawings. See Repertory of Arts, vol. 2 (second series), p. 81.]

A.D. 1802, September 20.—N° 2646.

**BRINDLEY, JONKIN.**—The invention refers to several different modes of attaching the beams to the sides of the ship. According to one arrangement short carlings are let down between the beams, their ends being tenoned either into the sides of the beams or into chocks brought against the sides, at the extremities of the beam, for that purpose. These carlings are about half the depth of the beam, and may either be flush with the top of the beam or sunk a few inches below it, in which latter case the strake of deck over it is letted down over the beams to meet it. The spaces between the carlings and the side are filled in with short pieces of timber between the carlings. In and out bolts between the beams pass through these carlings and every accessible timber of the frame. If the carlings are not flush with the top of the beam, short thwart-pieces are laid on them to receive the deck. According to

another arrangement he attaches the beam to the side by an iron tie-plate, the horizontal arm of which lies along the beam, and the vertical arm up and down the side of the frame timbers. Or he proposes to put a vertical pillar against the side at each beam, allowing it to run up to the deck, and cutting off the beam to rest on a shoulder formed in it. A horizontal iron strap braces this pillar to the end of the beam, and both to the frame timber, if desirable. A diagonal iron plate, straight or curved, also connects the beam and the pillar; and a plate of iron bent so as to form a rectangular figure fits in against the side, upon the deck below, and under the beam, to all of which it is bolted. Or, he bolts cheek pieces against the sides of the beams, extending into the openings between the timbers; the ends of these cheeks are cut with a dovetail, and cheek pieces are worked on the sides of the frame timber above and below the tail to confine the beams. Or, he attaches the beams to the side by dog-plates clenched outside the ship.

[Printed, 7d. Drawings. See Repertory of Arts, vol. 3 (*second series*), p. 1.]

A.D. 1802, October 2.—N° 2650.

FORDER, WILLIAM.—“A diving machine, to be used in and  
“ about stopping holes and leaks in ships’ bottoms, and for other  
“ purposes, which will be of general benefit and advantage.”

The inventor describes a diving dress, the upper part made of sheet copper, and the lower of leather. It is supplied with air by means of a pair of bellows, through a leather pipe.

[Printed, 6d. Drawings.]

A.D. 1803, July 27.—N° 2723.

STUARD, JAMES.—“A method to strengthen ships or floating  
“ vessels.” The inventor lays “a keel on each side the middle  
“ line, distant from it, including the thickness thereof, one sixth  
“ of the average breadth at loading draft of water, or a little more  
“ or less, according to the fulness or sharpness of the ship, which  
“ keels may be bolted through the floor timbers or futtocks, or  
“ both, and through keelsons on the inside; to have no keel on  
“ the middle line, except for a short length to connect the stem  
“ and stern post where the side keels end.” These side keels  
“ not only prevent the ship from straining, by keeping her upright  
“ when on shore, but strengthening her at all times, make a good

## SHIP BUILDING, REPAIRING,

... bottom for a double row of pillars under the beams, and ... advantageous to her sailing." "Ships on this construction may be built without shoring up, and launched without having these pieces fitted on their bottom, whereby the coppering may be completed on the stocks." He also proposes to fit diagonal carlings between the beams on all the decks, or to lay the flat diagonally, changing the direction of the strakes several times in the length of the deck. Also, instead of working the ceiling planks in the common way, they may be laid diagonally, and the weight of both ends thrown on the middle, "which must tend to prevent hogging." The bottoms of barges or any other vessels may also be strengthened by diagonal pieces, "which pieces may be either short, to go between the floor timbers, or long and scored out about half the thickness, to let them down between the floor timbers; also the sides may be strengthened in the same manner." "Boats with keels on this construction are better adapted for loading on a beach, carrying a large gun, or landing troops."

[Printed, *ls.* Drawings. See Repertory of Arts, vol. 4 (*second series*), p. 6.]

A.D. 1805, May 18.—N<sup>o</sup> 2849.

HOBSON, CHARLES, SYLVESTER, CHARLES, and MOORHOUSE, JOHN.—"A method of sheathing ships, &c." The material made use of for this purpose is zinc, cast into ingots, bars, or pieces of any convenient size, and afterwards rolled so as to convert it into plates of any required thickness. The bar or piece previous to rolling must be heated by fire to a degree of heat between two hundred and three hundred degrees of the scale of Fahrenheit's thermometer, and kept at that heat till the metal is reduced to one-fourth of its original thickness, after which it may be rolled to the thickness required without further heating. After this process, the plates are found to be very hard and difficult to be bent or worked; they must therefore be annealed by again heating them to the temperature before mentioned, and they will then possess the tenacity and flexibility required for sheathing ships, &c. They may be fastened with iron nails to ships or vessels having the usual treenails, bolts, or fastenings, but not of copper; or otherwise, in preference, the nails may be of iron, coated with zinc or spelter, or with tin.

[Printed, *3d*. No drawings. See Repertory of Arts, vol. 9 (*second series*), p. 251; and Rolls Chapel Reports, 7th Report, p. 190.]

A.D. 1805, August 9.—N° 2874.

**COLLINS, WILLIAM.**—A ventilator for the purpose of ventilating close carriages of every description, cabins of ships, &c., and by which sound may also be conveyed for certain useful purposes. “ I take or provide a circular box, made of brass, or any other proper material, of about an inch in depth ” and “ four or five inches in diameter, consisting of two rims, one larger than the other: the larger one has the bottom to it, the lesser one I make to turn in the larger one, to which I affix a pierced or perforated front or top, which may be done to any pattern; to the outer or larger rim I affix two or more tubes of a convenient length, at right angles, as large as the depth of the box will admit of. On the inner rim I make holes corresponding to the size of the tubes, which by turning round are made to close any one or more of the tubes at pleasure.” “ This box or ventilator may be fixed ” (if for close carriages, &c.) “ between the lining and the roof, the pierced or perforated front to be visible; the tubes are then to be extended to the extremity or outside of the carriage,” &c. One or more of the tubes may also be made to convey orders to a person outside. “ If made on a larger scale for the purpose of being applied to the ceilings of rooms, cabins of ships, &c., both the top and bottom of the box may be fixed to one rim, with large perforations in the front.”

[Printed, 3d. No drawings. Referred to in Rolls Chapel Reports, 7th Report, p. 190.]

A.D. 1806, June 6.—N° 2940.

**GWYNNE, LAWRENCE, and NOBLE, PETER.**—“ Certain improvements in chain and common pumps.” The improvement in chain pumps has reference to the mode of uniting the links of the chains. The inventors state that at the junction of each pair of links a forelocked bolt passes through both for the purpose of uniting them, and they propose to reduce the number of these bolts by casting short pins or dowells at the ends of each single link, to fit into corresponding holes in the sides of the double links, fastening the two sides of the double links by a forelocked bolt through the middle. The improvements in common pumps consist in an arrangement by which they can be converted into

No. 19. D

fire engines The barrel of the pump is enclosed within a larger barrel, the enclosed space communicating with the external air only through the nozzle or spout. The lower box or valve is fixed in the internal barrel, a solid piston working above it. A communication is made between the upper part of the inner barrel and that part of it which lies below the lower box, on the side further from the spout, by a pipe leading up within the space between the two barrels; the lower end of this pipe is closed by a valve in the side of the inner barrel. Opposite its upper end a valve opens from the inner barrel into the space between the barrels; by this means the down stroke of the piston causes the water to rise up the pipe to the upper side of the piston, whence it is forced through the said valve into the space over the spout, and then ejected as the piston ascends again. The water which enters the inner barrel through the lower box as the piston rises effects its escape on the down stroke through a valve adjacent to the spout; when the nozzle is open, and there is sufficient water-way, "the fluid will issue forth in the same manner as from a  
 " forced pump acting both ways; but if the aperture be made  
 " small by a pipe or nozzle, as in the fire engine, a resistance will  
 " be afforded to the emission of the water, and the fluid will rise  
 " between the two barrels, and will become subjected to the  
 " reaction of the included air in the same manner as in any other  
 " air chamber or vessel, and in a constant stream will be projected  
 " out, and the pump will act as a fire engine." When a pump handle is "assisted in its action by the libration of a weight," the inventors give additional assistance by placing springs to react upon such part of the handle or arm as may be most convenient.

[Printed, 6d. Drawings. Referred to in Rolls Chapel Reports, 7th Report, p. 102.]

A.D. 1806, August 30.—N<sup>o</sup> 2964.

**WILSON, CHRISTOPHER.**—"A new system of naval architecture," which consists in the following improvements.

Firstly. The ribs or the timbers between the outside and inside planking are to be placed longitudinally and are close-jointed so as to form one compact mass.. The adjacent timbers are fastened together by mortise keys driven from inside to outside in the joints, and diagonally across the joints on the outer surface. The planking may be put on in what direction is most convenient for

the conversion of plank, but the more the seams of the planks cross the seams of the timbers the better.

Secondly. To dispense with knees to the beams, and fit two horizontal tapering chocks against the timbers between adjacent beams, either butting against each other, or lapping one over the other. The chocks to be bolted to the side, and fastened to the beams by diagonal keys.

Thirdly. To build small fast-sailing vessels on the "self-balanced" principle. This consists in "having double sides above water, with partitions between the two sides" to "form compartments." By reason of this increase of breadth above the water the vessels "will carry a great deal of sail," and by making the top water-tight "they can neither sink nor upset."

Fourthly. An improved rudder and fish well for a cod smack.

Fifthly. To form the deck without beams of two thicknesses of plank, dovetailing the ends of some of the lower or athwartship pieces into the clamp.

Sixthly. To construct building blocks with one or more triangular pieces, uniting them by mortise wedges.

Seventhly. To unite timber for making masts, &c., by means of mortise wedges.

Eighthly. An improved double scarp.

Ninthly. An oar made of one or more pieces, and having its blade making an angle of 45° with the "plain of the loom," to avoid the necessity for "feathering."

Tenthly. To build "carvel built" boats with two skins, one vertical and the other horizontal.

Eleventhly. To remove the acid from tar, by mixing chalk or some other calcareous body with it.

Twelfthly. A new "top for laying the strand of ropes."

[Printed, 1s. 8d. Drawings. Referred to in Rolls Chapel Reports, 7th Report, p. 192.]

A.D. 1806, September 6.—N° 2965.

NEWMAN, ROBERT.—This invention consists in the following matters. "First, an apparatus or helm containing two rudders, "formed and worked in the direction of the sides, in lieu of one "placed in the centre line of the vessel, by which bodies of the "greatest capacity may be governed, guided, or steered, more, "and stayed with greater certainty, ease, and safety. Secondly,

"in a concave or hollow form of side and bottom that will make vessels of a light draught of water keep a better wind, carry more sail, and roll less." According to the proposed construction, the transverse sections of the vessel are either rectangular, or differ from rectangles in having the bottom and sides hollowed, and the latter extended down to a level with the under side of the keel. The ship does not taper towards the extremities, but is rounded slightly forward, and has its capacity abaft "internally contracted to a form resembling a swallow's tail, by which the vessel derives the" accelerating "impulse from the closing volume of water without that loss of stability or power of carrying sail" inseparable "from external contraction." The inventor states that resistance to leeway may be increased "by ribbing or indenting the coat of the side with projecting or binding planks that obstruct in a side direction only, while they strengthen the vessel and protect the caulking."

[Printed 7d. Drawings. See Repertory of Arts, vol. 10 (second series), p. 63.]

A.D. 1807, February 16.—N° 3011.

**STANHOPE, CHARLES, EARL.**—The improvement consists in constructing ships with flat bottoms, and with sides so formed that all the vertical transverse sections are rectilinear and flare outwards. The horizontal sections are parallel to the middle line for a long distance amidships, then curve suddenly inwards, and continue in straight or nearly straight lines to the stem and stern post. The object of the inventor is to "construct ships and vessels of a small draught of water with the maximum of advantages," because "the resistance of water increases gradually and regularly as the depth of the water increases, although in a less rapid ratio, so that the minimum of resistance to the progressive motion of ships and vessels cannot be obtained except upon the principle of their being so constructed as not to descend into that part of the fluid where the unalterable law respecting fluids would render the resistance so much more considerable than at a more moderate depth." "Ships and vessels constructed" in this manner "have the excellent property of making less leeway than other ships or vessels of the same draught of water," and have the lateral resistance to the leeway more advantageously placed. I deem so constructed to be called "Stanhope weatherers."

The inventor attaches to the ship's bottom by hinges a row of metal plates about two feet square, which he calls "gills;" they can be drawn up to lie flat against the bottom, from within the ship, or held in a vertical position to act as leeboards. He says, "Head gills or stern gills, or head and stern gills conjointly, may be used either with the rudder or without it, and also as substitutes for the rudder in case it should ever happen to be lost or rendered unserviceable. The head gills in particular are admirably calculated to assist a ship or vessel to weather well, and to put her head about rapidly in critical situations where no time can safely be lost." He also describes an arrangement of outriggers, called "protectors," for the purpose of affording protection against that "most mischievous invention for destroying ships and vessels known by the name of submarine bombs, carcasses, or explosions," and also for the same purpose certain machines called "straddlers," which are so constructed as to accompany a ship or vessel on her voyage, "following her, and yet sheering or straddling sideways at the same time."

[Printed, 9d. Drawings. See Repertory of Arts, vol. 12 (*second series*), p. 1; and Rolls Chapel Reports, 7th Report, p. 198.]

A.D. 1809, April 29.—N<sup>o</sup> 3231.

TREVITHICK, RICHARD, and DICKINSON, ROBERT.—The first of these inventions is a moveable caisson or floating dock, made of wrought-iron plates. The internal figure of the said caisson resembles that of a boat. It has a flange six feet wide extending horizontally outwards from the upper edge for the workmen to stand upon, and also to strengthen the caisson; and it is surrounded by an air chamber or by air chambers consisting of wrought-iron plates rivetted together, so as to form a semi-cylindrical hollow protuberance extending along the sides of the caisson horizontally. Water is admitted into it until it is wholly immersed. It is then to be hauled under the bottom by ropes from the ship, and afterwards pumped out from a barge placed alongside. The ship is to be supported within the dock by props or shores.

The second is to build of iron "ships of war, East Indiamen, and other large decked vessels." The decks as well as the sides of such ships to be of plates of wrought iron, "rivitted or joined by screws."

The third consists "in making masts, bowsprits, yards, and  
" booms, of wrought iron, out of plates rivitted or screwed together  
" in hollow or tubular forms. 'These masts being hollow tubes,  
" the upper masts may be made to slide into the lower mast."

The fourth consists in seasoning timber, and in bending it to  
any required shape. For these purposes the said timber is placed  
in iron chambers, disposed over a long horizontal flue which com-  
municates between a fireplace or furnace and an upright or  
ascending chimney. The heated air and smoke which have passed  
through the fire, and are capable of producing or maintaining any  
combustion in the wood, are admitted into the chambers by regu-  
lated openings, and so thoroughly heat the said wood that the  
crude sap and pyroligne acid become evaporated and driven out.  
In these chambers the wood is set to shape by means of screws,  
chains, or bearing pieces.

The fifth consists in substituting for the ribs of ships, two thick-  
nesses of bent plank placed diagonally.

The sixth is to make buoys of cast-iron or of wrought-iron  
plate.

The seventh is a method of working an arm or lever attached to  
a small portable steam engine for the purpose of "hoisting, pump-  
" ing, rowing, or other similar work in naval affairs."

The eighth is a "rowing trunk, tube, or prismatic cavity."

Lastly, to the boiler of the portable steam engine a vessel is  
fixed for cooking provisions, and for condensing steam in order to  
procure fresh water.

[Printed, 4/1. No drawings. Referred to in Rolls Chapel Reports, 7th  
Report, p. 204.]

A.D. 1810, June 19.—N° 3351.

**LINDSAY, JOHN.**—"A boat and various apparatus whereby  
" heavy burthens can be conveyed on shallow water on rivers  
" wherein shoals and other difficulties unpede navigation, and  
" whereby the lives of men will be saved from wrecks and other  
" situations of imminent danger at sea or on rivers." Also for  
" enabling the bottoms of ships to be examined with accuracy and  
" expedition, without the necessity of moving the masts or cargo."  
To enable a loaded vessel to pass a shoal, the inventor places on  
each side of her a long flat vessel or "lightner." Across the three  
vessels he then places two strong beams, which he calls "depres-

“screws,” about twelve or fifteen feet asunder. The loaded vessel has fixed in a “strong kilson in her bottom two powerful screws, and of length higher than her gunnels; the said two beams or depressers, having holes bored in the centre of them, receive the heads of the two screws; two capstans with bars being fixed in the head of each screw, the vessel which is loaded becomes, by the action of these elevated screws, gradually raised.”

“When the shoals and difficulties in a river are so great in places that the lightners cannot enable the loaded vessel to pass,” he proposes to sink some “moveable weirs” to “direct the current of the river into so narrow a channel that the encrease of water will so deepen the shoal that the vessel and apparatus will be enabled to pass the said shoal, and thereby continue her voyage.” Iron wheels are fitted at the ends of the beams, that the vessel may be hauled off the “lightners” should they ground. The inventor states that he relinquishes all claim to patent right with regard to the means of saving life and examining the bottoms of vessels mentioned in the Letters Patent.

[Printed, 8d. No drawings. See Repertory of Arts, vol. 19 (*second series*), p. 13; and Rolls Chapel Reports, 7th Report, p. 209.]

A.D. 1810, September 26.—N<sup>o</sup> 3381.

NORRIS, THOMAS.—“A new mode of sheathing or covering the bottoms of ships or vessels with certain matters” or materials, “so as to be a substitute for copper.” The invention consists “in the application of lead,” rendered hard to a proper degree by the addition of regulus of antimony, “arsenic, tin, or any other mineral or metallic substance that will answer the purpose.” The proportions may be, lead, “one hundred pounds; tin, twelve pounds; regulus of antimony, three pounds; arsenic, three pounds; or lead, one hundred pounds; tin, twenty pounds; or lead, one hundred pounds; regulus of antimony, three pounds; arsenic, three pounds.”

[Printed, 3d. No drawings. Referred to in Rolls Chapel Reports, 8th Report, p. 86.]

A.D. 1811, May 9.—N<sup>o</sup> 3447.

HAWKINS, GRIFFIN.—An apparatus calculated for the better “defence of ships and vessels of different descriptions against being boarded or taken possession of by an enemy.” The

inventor proposes to attach to any convenient place on the inside of the bulwark or upper works of the vessel, a long wooden case about seven inches square, in which a number of spikes or spears are fixed about a foot apart. These are so arranged that they will lie within the cover when they are not in use, and when required may all be turned outwards together by moving the handle of a lever. The box containing this row of spears is also made capable of turning round by the action of a lever, thus giving them as much elevation or depression as may be necessary.

[Printed, 5½d. Drawings.]

A.D. 1812, April 21. — N° 3556.

**BLUNT, CHARLES FLY.**—The “invention consists in the  
 “arrangement and construction of a ship’s stove or fire hearth,  
 “improved in its general construction,” and by the adaptation to  
 it of apparatus for the conversion of sea or foul water into fresh  
 water. The inventor says, —“I remove the fireplace for the boilers  
 “to the hinder part of the machine, where it is at the greatest  
 “possible distance from the cables, which, in the usual mode of  
 “construction, are more or less subject to the damages incident  
 “to an exposure of the action of the fire upon them, and where  
 “such alteration in the figure of the hearth is required, I curve  
 “the whole hinder part of it, making the boilers of a corresponding  
 “figure, whereby a considerable saving of space is obtained between  
 “the ship’s bits for those who attend the fire hearth and its opera-  
 “tions. When the figure of the fire hearth is rectangular I still  
 “place the fireplace for the boilers at its hinder part. For the  
 “production of fresh water from sea or foul water, I adapt to the  
 “boilers of the hearth alembical vessels, of peculiar construction,  
 “which accord with the form and local situation of the boilers, so  
 “as not to be cumbrous to the vessel, and are furnished with  
 “contrivances to facilitate the operations of condensing the vapour  
 “they receive from the boilers, and for cooling the produce, with-  
 “out the incumbrance and cost of the condensing worms and vats  
 “hitherto used for that purpose.”

[Printed, 1s. 4d. Drawings. Referred to in Rolls Chapel Reports, 8th Report, p. 90.]

A.D. 1812, June 25. — N° 3578.

**ARIELL, WILLIAM.**—Certain machines or machinery “for  
 “extracting corroded iron and other nails and bolts out from

“ ships’ bottoms, masts, decks, and any other part thereof.” If a nail or bolt should refuse to start on the application of the crows, then with a small cold chisel, trim away the head of the nail to any size less than one inch diameter, and also the wood round the nail, with a small gouge from  $1\frac{1}{2}$  inches to  $\frac{1}{2}$  an inch diameter, about one inch in; then with a tapping bitt spring a worm of four or five threads on the head of the nail; turn the tapping bitt off, and take a female screw drawing bitt, having a screw cut on the upper part of its shank, and turn it on the head of the nail with a lever. Take the lever off and apply a triangular frame over the screw shank against the ships’ bottom or deck for an abutment. A long spanner being then turned on the screw cut in the shank, the resistance offered by the top of the triangular frame to the descent of the spanner will draw the nail or bolt.

[Printed, 9d. Drawings. Referred to in Rolls Chapel Reports, 8th Report, p. 90.]

A.D. 1812, August 5.—N<sup>o</sup> 3592.

THOMPSON, ROGER.—“ A new mode of working two or more  
“ pumps for delivering water out of leaky ships, stone quarries,  
“ or mines of a moderate depth; employing in the operation only  
“ about half the usual manual force, and delivering nearly double  
“ the quantity of water.”

The object of this invention is to work two pumps together with ease. For this purpose they are placed opposite each other on the ship’s deck, with an interval of about six inches in the clear between them. In this space an iron stanchion is erected, on the head of which a beam is pivoted. The length of this beam is equal to the distance between the spears of the two pumps, and at the extremity of each of its arms there is a sector of a circle with cogs, working in similar cogs wrought on the spears. A reciprocating motion being given to the beam by long bars with cross handles to them, the required vertical motion is communicated to the spears or rods.

[Printed, 1s. Drawings.]

A.D. 1812, October 31.—N<sup>o</sup> 3606.

CONGREVE, WILLIAM.—“ An improved system of securing  
“ buildings, towns, dockyards, and ships from fire, and for the  
“ raising of water to the top of buildings for general purposes.”

The inventor proposes to use a reservoir of compressed air, in conjunction with a reservoir of water, by means of which the water may be forced through pipes in any required direction without delay, and distributed in the locality of the fire by perforated nozzles. He also proposes to avail himself of the powers of compressed air for locomotion, &c.

[Printed, 8d. Drawings. Referred to in Rolls Chapel Reports, 8th Report p. 91.]

A.D. 1812, December 19.—N<sup>o</sup> 3628.

**MORGAN, JOHN.**—"A new power applicable to the propelling  
" of vessels and boats of every description through the water, and  
" also to the pumping of them." The inventor proposes to work the pumps or propel the vessel by means of a lever, one end of which floats on the water outside the vessel, and the other is attached to suitable gearing inside. Motion is communicated to the lever by the rising and falling of the waves, or of the vessel.

[Printed, 8d. No drawings. See Repertory of Arts, vol. 23 (*second series*), p. 298, and Rolls Chapel Reports, 8th Report, p. 95.]

A.D. 1813, September 4.—N<sup>o</sup> 3736.

**BRAZILL, JACOB.**—"A machine to work capstans and pumps  
" on board ships, which machine may also be applied to various  
" other useful purposes." The inventor proposes to put upon the spindle of a double capstan, and just above the lower drum head, a small cog wheel with bevelled teeth. At the height of this wheel and lying against it is a horizontal axle, on which there is a portion of a screw for driving the wheel. Motion is communicated to the capstans by turning handles at the extremities of this axle. At the upper end of the spindle of the capstan a horizontal toothed wheel is set, for giving motion to a horizontal axle over it, at the ends of which axle are cranks for working a pair of pumps; wheels for the chain pumps may also be fixed on this axle. Any pumps or other gear may be worked at a distance from the said machinery for any other useful purposes.

[Printed, 8d. Drawings. See Repertory of Arts, vol. 41 (*second series*), p. 1, and Rolls Chapel Reports, 8th Report, p. 99.]

A.D. 1814, July 26.—N<sup>o</sup> 3827.

**DONCASTER, WILLIAM.**—"Improvements in the construction,  
" uses, and mode of navigating ships and vessels of various

“ denominations in marine and inland navigation; and for  
“ abstracting for separate use such powers and machinery as  
“ form an hydrostatic or other mill, and also a mode and com-  
“ bination applicable to easing the draught and accelerating the  
“ motion of carriages travelling on land; and also a dining table  
“ upon an improved principle.” “ The hydrostatic ship contem-  
“ plates, in the principles of its construction, superior tonnage,  
“ safety, and progression; in its uses, to act as a sort of travelling  
“ mill, if not a fishing vessel also; and in its mode of navigation,  
“ to enable the mariner to perform the greatest part of his duties  
“ comfortably under cover.” The inventor gives no intelligible  
account of either the nature or uses of this vessel. He says,  
“ there being a beautiful division of weight, power, and resistance  
“ throughout the whole of the ship, and no main dependance  
“ anywhere, with the five keels, two bases, and three distinct com-  
“ partments, carrying their lading over the water, not through it,  
“ the patent ship ought, like a cat, to have nine lives.”

[Printed, 6d. Drawings. Referred to in Rolls Chapel Reports, 8th Report,  
p. 106.]

A.D. 1814, November 7.—N° 3850.

WALTERS, JOHN.—“ Certain improvements in the construction  
“ and fastening of the frame timbers or bends of ships or vessels,  
“ whether building or under repair.” “ In constructing the frame,  
“ timbers, or bends,” the inventor proposes to “ affix to the sides  
“ of each, at the butting joints of the timbers of which it is  
“ composed, a plate of iron or other metal covering, each joint  
“ extending above and below, and bolted through the frame;”  
“ and for fastening or connecting together the frames or bends,  
“ and thereby giving general strength throughout the whole  
“ frame or carcase of the vessel,” to “ introduce, through some  
“ section athwart the ship or vessel to be built or repaired, some-  
“ where near the centre of gravity,” a principal transverse frame,  
secured to the keel, and having internal diagonal and level braces.  
He proposes further to affix to the sides of the ship or vessel  
certain braces, which he denominates “ principal hull braces, made  
“ of iron or other metal let in flush on the outside of the frame  
“ timbers, and bolted to them, descending in an inclined direc-  
“ tion from the upper part of the said principal frame (to which  
“ they are made fast) in the line of shortest distance over the

" curved surface down to the lower extremities of the vessel, and  
 " terminating at such points " " in the bottom as may be found  
 " to afford the greatest facilities or convenience for being there  
 " fixed in a secure manner. Also," he says, "(if the vessel is not  
 " constructed with the spaces between the frames filled in solid),  
 " for the better stiffening of the whole hull, I introduce behind  
 " or within the said principal hull, braces, chocks, or strutting  
 " pieces " " of timber scantling, tailed in between frame and  
 " frame, acting as arches in the direction of the said braces; and  
 " for the more effectually tying or binding together the whole  
 " structure, I employ, in addition to the foregoing braces, one or  
 " more braces," " which I denominate horizontal hull braces;  
 " the said horizontal hull braces are let in flush with the frame  
 " timbers (to which they are bolted or made fast, as also in some  
 " cases to the principal frame)," and they extend the whole length  
 of the vessel on both sides, forming a kind of longitudinal hoop,  
 behind or within which, chocks or strutting pieces may be tailed  
 in between timber and timber, as described above for the principal  
 hull braces.

[Printed, 10d. Drawings. See Repertory of Arts, vol. 23 (second series),  
 p. 33d.]

A.D. 1814, November 10.—N<sup>o</sup> 3851.

HOWARD, WILLIAM.—" An improved apparatus or gear for  
 " working the pumps on board ships, which may also be applied  
 " to churning and various other useful purposes on shore."

The invention consists in " the application of cranks upon a  
 " spindle supported by stanchions," " to which cranks the pump  
 " (or piston) rods are attached and put in motion by the revolu-  
 " tion of the said spindle, by means of bevel cog wheels acting at  
 " right angles, and a handle and fly wheel to give motion "   
 thereto

[Printed, 9d. Drawings. See Repertory of Arts, vol. 27 (second series),  
 p. 133.]

A.D. 1815, March 9.—N<sup>o</sup> 3892.

WOOD, WILLIAM.—" The manufacture of a material or materials,  
 " and the application thereof to the more effectually making  
 " water-tight and seaworthy ships and all other vessels." The  
 invention consists in the application of sheets or flat pieces of

tarred felt to the outside of ships and other vessels for the purpose of preventing leakage. " Sheets of the dimensions of three feet by " one foot four inches are made of about half an inch in thickness, " more or less, except about an inch in width from each edge, " through which width the thickness gradually diminishes to the " outer edges." The bottom of the ship having been payed with a mixture of tar and pitch or " other adhesive and proper material," these sheets are laid on overlapping each other at the edges and ends, and are fastened with scupper or other suitable nails. " The " adhesion of the sheets of felt to the parts to which they are " applied may be further secured by a covering of thin plank or " copper sheating, or by any other of the obvious and suitable " methods known and practised by shipwrights."

[Printed, 6d. Drawings. See Repertory of Arts, vol. 29 (*second series*), p. 151; and Rolls Chapel Reports, 8th Report, p. 106.]

A.D. 1815, June 22.—N<sup>o</sup> 3932.

DICKINSON, ROBERT.—" An improved mean or means for " facilitating the propulsion and for the safety of boats or other " vessels through the water." The invention consists " of a more " efficacious method of applying the power or strength of men to " turn paddle wheels fixed on the sides or any other part of ships " boats, vessels, or craft, to row or propell them." " Having " ascertained," says the inventor, " that there is a great advantage " gained by rowing with blades of greater breadth than those " which are made of wood can posses from want of strength, I " prefer a broader blade than those in common use," and " make " my blades of iron, and also so much of the shank as lies between " the rullocks of the boat when rowing and the blade, or as is " required to meet the strain between the rullocks of the boat and " the blade, such part being, for lightness as well as strength, " composed of a hollow iron tube." Also " to add to the security " of vessels, where it is desirable that they should possess the pro- " perty of a life-boat (a property which should be very generally " given to all boats and vessels), I construct them of iron, with " a hollow water-tight gunwall of sufficient capacity to give buoy- " ancy to the vessel with any load it may ever be required to " carry; or I enclose or cover in one or both ends in such a " manner as to prevent the entrance of water, and at the same

"time I put hollow water-tight seats along the side, as well as  
"across, within the vessel."

[Printed, 3d. No drawings. See Repertory of Arts, vol. 28 (*second series*),  
p. 133.]

A.D. 1815, August 15.—N<sup>o</sup> 3952.

EDWARDS, JOHN.—"The method or means of preventing  
"leakage in ships, boats, and other vessels." For this purpose  
"lay strips of coarse brown paper or canvas soaked in tar or in  
"waterproof cement, made of glue and linseed oil boiled  
"together; lay these over the seams in the inside; then lay  
"battens or narrow planks of wood, of about four inches broad  
"and about one inch or one inch and an half thick, over the seams  
"also, and nail them tight down with ragg'd nails." Or, line the  
inside of a ship with "any sheet metal, such as copper, iron,  
"lead, &c., in the following manner:—Nail the sheets of metal  
"close, edge to edge or edge over edge, and solder the seams."

[Printed, 3d. No drawings. See Repertory of Arts, vol. 29 (*second series*),  
p. 75; and Rolls Chapel Reports, 8th Report, p. 110.]

A.D. 1816, March 23.—N<sup>o</sup> 4010.

SORBY, JOHN, junr.—"A method of making an auger for the use  
"of shipwrights, millwrights, carpenters, and other artificers, upon  
"a new and improved construction." The "invention consists  
"in the addition of a screw, formed at the nose or extremity of  
"the shell of the auger, to precede the entrance of the shell or  
"bit, and also in varying the shape of the nose of the auger."

[Printed, 3d. Drawings. Referred to in Rolls Chapel Reports, 8th Report,  
p. 115.]

A.D. 1816, March 23.—N<sup>o</sup> 4012.

HADDOCK, URIAH.—"A new species of paint, colour, and  
"cement, for painting and colouring and preserving the interior  
"and exterior of houses, ships, and other things." The compo-  
sition, "particularly adapted to the covering of ships' bottoms and  
"every other substance requiring preservation from destruction  
"by different changes of atmosphere, sea and other water, har-  
"moles, worms, and other insects," is made as follows:—Take  
one hundred and twenty gallons of any of the seed oils, or, when  
"intended for inferior purposes, of the animal oils or fats, mix with

this “one thousand two hundred pounds weight of any argillaceous earth,” and boil it over a slow fire, adding a sufficient quantity of water to form the whole into a substance similar in consistence to cream; then add by degrees “four hundred and eighty pounds of vitreous oxide of lead, and keep the whole gently boiling until it is formed into an alumino-metallic substance.” For the purpose of rendering this composition soluble, add to it three hundred pounds weight of turpentine; and also, when not intended for fine purposes, “five hundred pounds weight of powdered iron scorizæ, or any of the oxides of iron, and three hundred pounds weight of powdered plumbago, both finely ground, in twenty gallons of spirit of turpentine, tar, or naphtha,” mixing the whole together in the boiler, with the “alumino-metallic substance or composition before mentioned, by stirring whilst gently boiling.”

[Printed, 3d. No drawings.]

A.D. 1816, December 10.—N° 4088.

WRIGHT, RICHARD.—“Certain improvements in the constructing and propelling ships and other vessels.” According to this invention “the vessel is constructed with one or more channels entirely thro’ her, fore and aft, open at the bottom, with sides nearly parallel.” These channels are made for the reception of one or more paddle wheels of a peculiar construction. The inventor also describes improvements in the steam engine by which the vessel is driven.

[Printed, 6d. Drawings. Referred to in Rolls Chapel Reports, 8th Report, p. 117.]

A.D. 1817, May 6.—N° 4115.

COLLINS, WILLIAM.—“An improvement or improvements in the composition and preparation of a metal for the manufacturing thereof into sheets or plates, and the application when so prepared and manufactured to the preservation of ships by sheathing or covering their bottoms therewith, and an improvement or improvements of the chain pump used on board ships.” The principle of the improvement of sheets or plates for sheathing ships, is the application of sheets composed of mixed metals in lieu of copper sheets; the mixed metal is of the nature or kind of metal known by the name of bronze, which is a mixture of copper and

tin in various proportions; eighty parts of copper and twenty of tin produce a metal that answers the intended purpose. The principle of the improvement on the chain pump consists in the application of a saucer of a peculiar construction. "Instead of the flat saucer now used, in which the edges of the leather act against the side of the chamber, which, when worn, they do not fill," "a metal saucer of a dished form" is constructed that receives the leather and keeps it in such a position, that the sides of the leather act against the chamber by the pressure of the water. "To prevent the leather being caught or turned back a circular plate is fixed over it, that admits of the action of the leather but defends it from injury."

[Printed, 3d. No drawings. See Repertory of Arts, vol. 32 (*second series*), p. 67; and Rolls Chapel Reports, 8th Report, p. 119.]

A.D. 1818, February 3.—N<sup>o</sup> 4222.

PRESTON, GRANT.—"An improvement in the deck glass rim and safety grate," which is as follows:—"The outside part consists of a brass or copper strong screw rim, with a broad flat edge to let into the deck as a fixture; the inside part is another rim which screws into the outside or fixed rim, containing a flush glass, but partly convex on the under side. The safety grate is likewise fixed into a screwed rim of the same size and strength as the one that contains the glass, each being made to screw either right or left," so that the glass may be taken out for ventilation, and the safety grate screwed in in lieu thereof, a ventilating fly fitting into the latter rim from below.

[Printed, 3d. No drawings. See Repertory of Arts, vol. 34 (*second series*), p. 141, and Rolls Chapel Reports, 8th Report, p. 122.]

A.D. 1818, April 8.—N<sup>o</sup> 4240.

ANNESLEY, WILLIAM.—"Certain improvements in the construction of boats, ships, and other vessels." The improvements consist, first, "in making the hull of the ship, boat, or other vessel of three or more layers of planks, the direction of the grain of the alternate layers proceeding from bow to stern of the vessel, and the direction of the grain of the intermediate layer or layers passing from one gunwale around and under the vessel to the other gunwale without being cut or separated by the keel, the whole of these planks

“ being well pinned, treenailed, or bolted together, without frame  
 “ timbers,” beams, knees, breast hooks, or stem. “ For small  
 “ boats, where great strength is not required, I sometimes make  
 “ use of only two courses of planking, that is to say, one outside  
 “ longitudinal layer, and one inner transverse layer, continuing  
 “ round from gunwale to gunwale.”

Secondly, “ in making the keel in three thicknesses, that is to  
 “ say, a middle thickness of timber keyed together and lying  
 “ horizontally fore and aft, which I term the core of the keel, and  
 “ a casing of vertical planks on each side, crossing the core,  
 “ together with a horizontal plank under the whole, which I call  
 “ the sole, to protect the ends of the cross planking.”

Thirdly, “ in producing from a given model on a small scale a  
 “ set of temporary frames or moulds for the purpose of giving to  
 “ the hull of the vessel the same figure and relative proportions  
 “ as the model.”

[Printed, 8d. Drawings. See Repertory of Arts, vol. 35 (*second series*),  
 p. 18; Register of Arts and Sciences, vol. 1, p. 17; Engineers' and  
 Mechanics' Encyclopædia, vol. 2, p. 653; and Rolls Chapel Reports, 8th  
 Report, p. 125.]

A.D. 1818, November 21.—N<sup>o</sup> 4315.

CLYMER, GEORGE.—“ Certain improvements on ships' pumps.”  
 The Columbian ship's pump or extinguishing engine is a force  
 pump, consisting of two cylinders placed side by side, and commu-  
 nicating at their bases with the pipe leading from the hold; and  
 also with a separate chamber, into which the water is forced by  
 the pistons, and from which it is delivered. The communication  
 with the hold may be suspended at pleasure, and a hose may be  
 attached to raise water from the outside of the ship. The pumps  
 are worked by a beam pivoted between the cylinders; cross  
 handles are fitted to it, and assistance may be given by means of  
 ropes attached to the upper end of a vertical arm rising from the  
 middle of the beam.

[Printed, 1s. Drawings. See Engineers' and Mechanics' Encyclopædia,  
 vol. 2, p. 362; Register of Arts and Sciences, vol. 3 (*new series*), p. 371;  
 and Rolls Chapel Reports, 8th Report, p. 130.]

A.D. 1819, March 23.—N<sup>o</sup> 4352.

MORTON, THOMAS.—“ A method of dragging ships out of the  
 “ water on dry land.” This method “ consists in the application  
 No. 19. E

“ of a particular kind of carriage to the inclined plane, platform,  
 “ road or slip up which the vessel is intended to be drawn,  
 “ which carriage runs upon the said inclined plane with trucks,  
 “ wheels or rollers, or it may slide with grease or other unctuous  
 “ substance, and the carriage can descend thereupon into the  
 “ water so that the vessell may be floated over it.” The vessel  
 must be steadied on the frame with blocks and shores, and then  
 the carriage thus bearing the vessel is hauled up the inclined  
 plane out of the water by capstans or other power. In con-  
 structing the carriage, “ one or more large beams of timber, iron,  
 “ or other fit substance is provided to lay along the keelway in  
 “ the middle of the inclined plane; this may be called the main  
 “ or keel beam.” To the under side of this beam, frames or  
 bushes, of iron or other substance, are fixed to receive trucks,  
 wheels, or rollers, or otherwise the under side of the keel beam  
 may slide on the inclined plane with any unctuous substance; the  
 said trucks, wheels, or rollers run, or the said keel beam may slide,  
 upon iron or other suitable substance laid down the keelway.  
 Two other similar beams are laid parallel to the main beam at a  
 distance from each other equal to the breadth of the largest vessel  
 which the carriage is intended to receive; these long parallel  
 beams are united together by cross pieces fixed athwart them and  
 attached to them in any convenient way. Blocks of different  
 heights and forms are fitted upon the cross pieces with grooves or  
 rabbets, in which they slide to or from the keel of the vessel; and  
 further to steady the vessel, several shores may be fastened by  
 joints or langes to the side beams of the carriage.

[Printed, 3d. No drawings. See Repertory of Arts, vol. 35 (second series),  
 p. 272. London Journal *Newton's*, vol. 1, p. 17. Parliamentary Report,  
 1829 (*Patent Law*), p. 209, and Ellis Chapel Reports, 5th Report, p. 120.]

A.D. 1820, October 16.—N<sup>o</sup> 4498.

WITTY, RICHARD.—“ Certain improvements in pumps of various  
 “ constructions for raising and conveying water and other liquids,  
 “ and also methods of applying a certain principle or certain prin-  
 “ ciples to ships' pumps, and for other useful purposes.” The  
 inventor describes his improvements as follows:—“ Instead of  
 “ letting the water or liquid escape from a common pump at the  
 “ usual place of delivery, I cause it to descend again in a siphon  
 “ pipe to the lowest level at which it can conveniently be delivered,  
 “ and as this descent is considerable in ships, breweries, &c., a

“ considerable saving of labour is effected in working pumps by a  
 “ descending column of water or liquid counterbalancing as much  
 “ in length of the rising column in the pump as the height which  
 “ it descends in the siphon pipe, to the place where it can be  
 “ delivered.” “ I also apply the power of men to work ships’  
 “ pumps and other pumps, and to machinery for various useful  
 “ purposes in manner following :—I construct a seat which I call  
 “ a vibrating chair, the back feet of which turn upon a centre as  
 “ a centre of motion. A man being seated in this chair with his  
 “ feet resting on a foot board, his knees bent upwards, and his  
 “ hands hold of a rod connected to a bent lever, to which a pump  
 “ rod (or crank and connecting rod for working machinery) may  
 “ be connected, exerts his strength to great advantage by work-  
 “ ing with the extensors of his legs while bringing them nearer to  
 “ an horizontal line, and bending his knees upwards alternately,  
 “ and at the same time exerting the muscles of his arms and  
 “ shoulders in working to and fro the rod connected with the bent  
 “ lever.” He also describes the use of a floating ball in connexion  
 with an index to indicate the depth of water in the ship.

[Printed, 7d. Drawings. See London Journal (*Newton's*), vol. 2, p. 245.]

A.D. 1821, January 19.—N° 4529.

PHILLIPS, CHARLES.—“ Certain improvements in the apparatus  
 “ for propelling vessels, and an improvement in the construction  
 “ of vessels so propelled.” This invention consists in placing or  
 fixing paddle or propelling wheels, however constructed, in an  
 horizontal position in boats or vessels, and in the construction and  
 application of moveable paddles to the same. Also in placing  
 below these paddle or propelling wheels “ a deck, with suitable sides  
 “ or casings to enclose the wheels, including the deck above; by  
 “ which contrivance a boat or vessel may be made that can be pro-  
 “ pelled in a high or rolling sea, and consequently will be a safer  
 “ or more suitable boat or vessel for sea purposes than any before  
 “ known or made use of.”

[Printed, 1s. 6d. Drawings. See London Journal (*Newton's*), vol. 2, p. 401.]

A.D. 1821, April 5.—N° 4549.

ANNESLEY, WILLIAM.—The invention forming the subject of  
 these Letters Patent is the same as N° 4240. By the former

## SHIP-BUILDING, REPAIRING,

~~Letters Patent~~ the invention was protected in England, Wales, and the town of Berwick-upon-Tweed; and these Letters Patent were granted to extend the protection to the colonies.

[Printed, &c. Drawings. See London Journal (*Newton's*), vol. 2, p. 345.]

A.D. 1821, May 1.—N° 4554.

LAW, ALEXANDER.—“Improvements in the formation of bolts and nails for ship and other fastenings.”

[No Specification enrolled. See No. 4571.]

A.D. 1821, July 14.—N° 4568.

DICKINSON, ROBERT.—The invention of “ships, vessels, or craft formed of metal boxes or trays, with ribs and transverse or caulking plates between them, so as to enable them to maintain their proper figure either when afloat or out of the water;” and, when the same are constructed wholly of iron, a means of covering them with copper, by the intervention of non-conducting plank covering between the iron and the copper.

The transverse and longitudinal ribs mentioned are deeper than the trays, which are arranged between them and riveted to them. They have flanges on their inner edges, but none on the outer, the latter projecting from the outer surface of the bottom between the trays, to be afterwards spread by the hammer, that all the joints may become water-tight.

For applying the copper sheathing, thin planking is wrought all over the surface of the bottom, and attached to it either by screws from the inside, or by short bolts with their heads let deeply into the wood, and secured inside by nuts. The copper sheathing is then applied in the ordinary manner.

[Printed, 107. Drawings. See London Journal (*Newton's*), vol. 3, p. 113.]

A.D. 1821, July 17.—N° 4571.

LAW, ALEXANDER.—“An improvement in the form of bolts and nails for ships, and other fastenings.” The improvement consists “in giving the bolts and nails used for ships, and other fastenings, such a form or figure that when once driven home into their place they cannot work themselves out by jars or strains,” which is effected “by forming them with four, five, or a greater number of sides, and consequently as many intervening angles,”

“ and making the said sides and angles to wind round the axis of  
 “ the bolt or nail in a screw form, so that the said bolts or nails,  
 “ when in the act of being driven into a hole of proper size,  
 “ revolve on their axis as they are made to advance by the force  
 “ applied to them, and the pieces therewith bolted together are  
 “ held much more securely than they would be with common  
 “ bolts.”

[Printed, 3*d*. No drawings. See Repertory of Arts, vol. 43 (*second series*), p. 207; and London Journal (*Newton's*), vol. 2, p. 334.]

A.D. 1821, November 10.—N<sup>o</sup> 4612.

PENROSE, WILLIAM.—“ Various improvements in the ma-  
 “ chinery for propelling vessels, and in vessels so propelled.”

[No Specification enrolled.]

A.D. 1821, December 5.—N<sup>o</sup> 4624.

BILL, ROBERT.—“ An improvement in the construction of cer-  
 “ tain descriptions of boats and barges.” In boats, barges, or  
 vessels built upon this plan, the bottom is always made of wood,  
 and the sides of iron. If the several planks in the bottom be  
 grooved and tongued, “ I use thin slips of iron instead of laths, as  
 “ is now done, between each plank. Instead of raising the sides  
 “ of plank, I make use of iron plates.” These plates should not  
 exceed two feet ten inches in width, and should be of a length to  
 allow three or four inches to be bent at the bottom to admit suf-  
 ficient rivets for effectually securing the plates to the bottom. The  
 whole must be rivetted together in the usual way. “ I also claim  
 “ as new the use of knees made of any iron, whether the rib be  
 “ on the middle or the side of the bar, where they are applied to  
 “ the purposes of connecting” these plates. To render wood more  
 durable it should be boiled in a mixture of pitch and tar, raising  
 the heat to three hundred and fifty degrees and upwards; this  
 heat to be continued from six to twelve or fourteen hours; then  
 rapidly draw off the hot stuff, and cover the timber with thir  
 varnish, consisting of “ one part of coal pitch and five or six parts  
 “ of spirit or oil of coal tar.” “ The manufacturing of such iron  
 “ as I use for knees ” (T-iron) “ is entirely my invention.”

[Printed, 5*d*. Drawings. See London Journal (*Newton's*), vol. 4, p. 117.]

A.D. 1821, December 20.—N° 4629.

GLADSTONE, JOHN.—“Improvements in the construction of  
“ steam vessels and mode of propelling such vessels by the appli-  
“ cation of steam or other power.” The inventor claims “the  
“ application of floats or paddles fixed to chains, and applying  
“ them either on the outsides of single vessels, or between double  
“ vessels, for the purpose of navigation, as circumstances may  
“ permit; the endless chains put in motion by the rotation of the  
“ wheels or cylinders round which they pass,” and “the mode of  
“ fixing the floats or paddles so that the greatest number of them  
“ in contact with the water shall be perpendicular to the horizon.”

[Printed, 5d. Drawings. See Repertory of Arts, vol. 43 (*second series*),  
p. 70, and London Journal (*Newton's*), vol. 4, p. 173.]

A.D. 1822, January 14.—N° 4639.

GORDON, DAVID.—“Certain improvements and additions to  
“ steam packets and other vessels, part of which improvements  
“ are applicable to other naval and marine purposes.” The first  
part of this invention consists in enclosing the paddle wheels of  
steam vessels in cases, “where the water is only suffered to enter  
“ through an aperture in front, and with the case or boarding ex-  
“ tending underneath the paddle wheels as near as may be not to  
“ impede their motion, at the same time that the hindermost  
“ part of the paddle wheel case is left quite open to allow the back  
“ water to escape freely.” The second improvement “is appli-  
“ cable to sailing vessels, as well as to steam packets, being for the  
“ purpose of keeping a vessel perpendicular in the water.” It  
consists in employing a vessel or tank, or a number of vessels or  
tanks, to be suspended over the weather side of the ship at a con-  
siderable distance from the side. These vessels or tanks “may be  
“ made of wrought-iron plate, or of tarred canvas distended by a  
“ hoop or hoops, or any other suitable material, and be furnished  
“ with a guy rope at bottom, for the purpose of turning out the  
“ water to empty the vessels or tanks. When the use of the  
“ weights become no longer necessary, they may be suspended  
“ from the ends of booms or davits over the ship's side, or  
“ from turning jibs similar to a crane, so as to be capable  
“ of being turned in close against the side of the ship.”  
The third improvement applicable to steam packets and other  
vessels is as follows:—Surround the ship or vessel at about the

height of the gunwale, with a chevaux-de-frise or line of railing, which is to be very thickly set with pikes. This chevaux-de-frise is to be made in a number of separate pieces so as to be bolted or otherwise fixed on the outside of the ship.

By this means no serious injury would be done by large waves coming on board a vessel, or the ship would not be in danger of being pooped.

The inventor also claims the application of such chevaux-de-frise to floating breakwaters.

[Printed, 9d. Drawings. See Repertory of Arts, vol. 41 (*second series*), p. 202; London Journal (*Newton's*), vol. 4, p. 174; Register of Arts and Sciences, vol. 3, p. 33; and Engineers' and Mechanics' Encyclopædia, vol. 2, p. 449.]

A.D. 1822, September 27.—N° 4706.

MOXON, JOHN DOWELL, and FRASER, JAMES.—A new combination and arrangement of the parts of a ship's hearth, particularly a method “of closing the mouth of the boiler or boilers, “by loose lids or covers which are adapted to enter into gutters “or channels formed round the mouth of the said boiler or boilers “for the purpose of containing water or other suitable fluid, “whereby the said covers are rendered sufficiently steam-tight to “enable the steam which is generated in the boiler or boilers to “be conducted off by a pipe or pipes to a cooling or condensing “apparatus.” This “condensing apparatus is adapted to operate “by a current or currents of air in conjunction with a supply of “cold water, or by currents of air alone, as may be found best to “suit the nature of the situation.”

[Printed, 9d. Drawings. See Repertory of Arts, vol. 45 (*second series*), p. 268; and London Journal (*Newton's*), vol. 7, p. 248.]

A.D. 1822, October 18.—N° 4717.

BRINDLEY, JOSEPH.—This invention consists in enclosing the various timbers of ships, boats, or other vessels, particularly those which constitute the frame, between strong plates or hoops of iron, copper, or other metal or metals, or combinations of metals, “which plates I call frame bands, and also in attaching the “various planking of boats, ships, or other vessels to form their “bottoms, sides, decks, and other parts, by means of long strips “of iron, copper, or other metal or metals, or combinations of “metals.” The outer frame bands pass completely round the timbers, and may be carried over the deck beam, in which case “the outer frame band of the timber on one side, the outer frame

"band of the timber at the opposite side, and the upper frame  
 "band of the deck beam between them will be all in one piece." In  
 like manner, the inner frame bands may be carried under the deck  
 beams, all in one piece. Over the first thickness of planking next  
 the timbers similar vertical hoop ribs are worked, which pass  
 directly under the bottom of the vessel, and coming up over the  
 like planking on the other side, are either cut off at the top timber  
 heads, or bent round over the deck plank, and the two ends  
 rivetted together, thus forming a complete hoop round the vessel.  
 These hoop ribs being secured in their proper position, another  
 thickness of planking is worked over them, having grooves cut in  
 it, to let in the hoop ribs over which this second planking is worked.  
 This being brought to its place, another set of hoop ribs are worked  
 in like manner over it, passing again completely round the vessel,  
 or else cut off at the top timber heads. A third planking is then  
 worked over these. The whole is then bolted together through  
 and through. "A series of metal rings, which I call combination  
 rings," are to be placed, in contact with each other, "fore and aft  
 "under the lower deck, for its support," resting on the keelson.  
 These rings are united to each other, to the deck, and to the  
 keelson, by bolts or flanges.

[Printed, in 3d. Drawings. See Repertory of Arts, vol. 43 (second series)  
 p. 129. London Journal (Newton's), vol. 7, p. 13, and Register of Arts  
 and Sciences, vol. 1, p. 117.]

A.D. 1823, January 16.—N° 4751.

**TAYLOR, JAMES.**—"A new method of constructing the bottoms  
 "of merchant ships, and placing the pumps so as to prevent  
 "damage to the cargoes by the bulge water." "In the old con-  
 "struction the dead rise is usually about half an inch to a foot  
 "across the floor, which on a floor of fourteen feet at twenty-six  
 "to twenty-eight feet beam would be seven inches." "To such  
 "a vessel I propose giving a wider floor with the same proportion  
 "of rise, so that the floor being increased to sixteen feet between  
 "the stowage, will give eight inches outside" "rise, with an  
 "additional security to the bottom and safety to the cargo." For  
 this purpose "I propose to bring on horizontal plank" chocks  
 "or dead woods on the timbers before bringing on bottom  
 "planks." The first chock to be seven inches deep on the edge  
 just the keel, and placed seven inches off, so as to allow for a  
 two-and-a-half inch plank on the side of the keel, forming a water-

course of four and a half inches, and thinned down with a small curve upwards to about four inches; the second chock will be about three and a half inches thick, placed three inches from the first, thinned down to about two inches; the third and last will be only a furring thinned off to nothing, and placed two inches from the second. Supposing these planks or chocks to run 25 feet forward, and 35 feet abaft the main frame, and to be 12 inches broad each, they will cover the floor timbers on the flat about half way to the floor heads. The second chock to be left open at the pump well. The chocks will thus form so many watercourses, and having also many thwart gutters the water will run to this well or reservoir in all directions.

[Printed, 1s. 1d. Drawings. See London Journal (*Newton's*), vol. 5, p. 132.]

A.D. 1823, March 22.—N<sup>o</sup> 4768.

HANCOCK, THOMAS.—The “invention consists in the mixing  
“ caoutchouc and its solvent with pitch or tar, or with pitch and  
“ tar combined together in various proportions, and thereby  
“ rendering these substances, namely pitch and tar, whether  
“ separately or in combination with each other, less soluble in  
“ water, tougher, more elastic, and more durable than pitch or  
“ tar, or pitch and tar mixed together, and used in their natural  
“ state, are found to be.” To make the compound for use in  
paying the bottoms of ships, or in preparing sheathing for ships,  
or paper or other substances for covering the bottoms of ships,  
or the roofs of houses or other buildings, dissolve three pounds  
of indian-rubber in one gallon of essential oil, and mix it with six  
pounds of pitch.

[Printed, 3d. No drawings. See Repertory of Arts, vol. 46 (*second series*), p. 332; London Journal (*Newton's*), vol. 8, p. 244; and Register of Arts and Sciences, vol. 2, p. 100.]

A.D. 1823, April 8.—N<sup>o</sup> 4773.

POPE, CHRISTOPHER.—This invention consists in “the covering  
“ of ships’ bottoms, roofs of houses, or other the like things ex-  
“ posed to the action of sea water, of the air, or of the weather  
“ generally, with thin plates or sheathing composed of tin and  
“ zinc, or of tin, lead, and zinc united.”

[Printed, 3d. No drawings. See Repertory of Arts, vol. 46 (*second series*), p. 203; London Journal, (*Newton's*), vol. 5, p. 289; Register of Arts and Sciences, vol. 2, p. 213; and Engineers’ and Mechanics’ Encyclopædia, vol. 2, p. 647.]

A.D. 1823, June 14.—N° 4802.

**MUSKET, ROBERT.**—To “improve the quality of toughened or refined copper for the purpose of being applied to the sheathing of ships and other purposes by adding thereto in the common reverberatory furnace a certain portion or portions of alloy or of alloys,” namely of regulus of zinc, of grain or block tin; of regulus of antimony, or of regulus of arsenic. If it be desired to improve copper previously alloyed in excess, the inventor adds thereto toughened or refined copper to bring the whole mass to the fibrous texture he requires, which result he ascertains by the process of assay.

[Printed, 4d. No drawings. See London Journal (*Newton's*), vol. 8, p. 245; Register of Arts and Sciences, vol. 2, p. 99, and Engineers' and Mechanics' Encyclopedia, vol. 2, p. 657.]

A.D. 1823, June 26.—N° 4806.

**WILLOUGHBY, MONCRIEFFE.**—The invention consists “in applying the whole or any part of the weight intended as the ballast to the vessel in the keel itself, by having a shifting ballast keel moving up and down by suspenders through water-tight grooves running perpendicularly right through the centre of the hull of a flat-bottomed vessel.” Thus a less quantity of ballast and a less depth of keel are required than would be necessary with the keels as at present constructed.”

[Printed, 7d. Drawings. See London Journal (*Newton's*), vol. 7, p. 193; Register of Arts and Sciences, vol. 1, pp. 217, 247, 330, and 345, and Engineers' and Mechanics' Encyclopedia, vol. 1, p. 190.]

A.D. 1824, June 15.—N° 4971.

**HARRINGTON, WILLIAM.**—This invention is a raft of balk and other timber held together by framework, and so fashioned at the ends, and generally so arranged, as to partake sufficiently of the form of an ordinary ship or vessel to be navigable on the seas by means of a rudder, and such masts, spars, sails, and rigging as are generally used for nautical purposes. The said raft is to have a keel, sternpost, and stem, put together in the ordinary way of ship building, also frame timbers, “set up or put together in the ordinary mode of ship building, but only in a more rude manner.” A plank or wale piece is secured to the outside of the frames, and a similar piece to the outside of the opposite frames; two planks or wale pieces must then be tied together by

means of stout cross planks or beams, the ends of which are to be dovetailed into the wale pieces; then the entire space between the said tie beams or planks and the floor timbers is to be filled with balk timber the whole length of the raft, and the ends of this balk are to be so cut or fashioned, and the balks themselves to be of such various lengths, as will form a run and bow to the raft. The sides of the raft are to be partially planked, and a deck is to be laid over the mass of timber to form a hollow space for the crew, with provisions, and other necessities of the equipment, when the raft puts to sea.

[Printed, 1s. 4d. Drawings. See Repertory of Arts, vol. 1 (*third series*), p. 356; London Journal (*Newton's*), vol. 10, p. 233; Register of Arts and Sciences, vol. 3, p. 307; and Engineers' and Mechanics' Encyclopædia, vol. 2, p. 372.]

A.D. 1824, December 7.—Nº 5050.

DICKINSON, ROBERT.—An improved air chamber made by inserting a number of small air vessels within a larger air vessel or chamber, by which means, in the event of the larger air vessel or chamber becoming injured, the smaller air vessels will remain entire, and preserve the effect of buoyancy in the vessel or floating apparatus to which they are attached. “The external vessel or  
“ chamber may be made of metal or any other material, rendered  
“ impervious to air and water by a coating of cloth, canvass,  
“ matting, or other such substance saturated with paint, varnish,  
“ cement, or other preparation. The internal vessels are to be  
“ waterproof bags or other vessels.” The “improved air chambers  
“ are particularly applicable to boats, barges, ships, and every  
“ other kind of floating vessel, for the purpose of preventing the  
“ said vessels from sinking, even though they are filled with  
“ water.” Such boats, barges, ships, and other vessels to be of iron or other metal, and to be constructed with air chambers between the ribs and double plates of metal, and in other places; which chambers are to be filled with small air vessels as above described, or with cork or cork shavings.

[Printed, 5d. Drawings. See London Journal (*Newton's*), vol. 10, p. 28; and Register of Arts and Sciences, vol. 3, p. 36.]

A.D. 1825, January 11.—Nº 5073.

ATLEE, JAMES FALCONER.—“A process by which planks and  
“ other scantlings of wood of every description will be prevented

“ from shrinking, and will be altered and materially improved  
 “ in their durability, closeness of grain, and power of resisting  
 “ moisture.” “ The plank or scantlings of timber to be operated  
 “ upon must first be reduced by sawing, planing, or other usual  
 “ and known means into pieces, having two of their opposite  
 “ sides parallel to each other so as to produce as nearly as may be  
 “ equal thickness in the piece throughout, or from one end to the  
 “ other, and being so prepared I pass such timber or scantling  
 “ between a pair of highly polished cast-iron or other metal  
 “ cylinders in the nature of a flattening mill or rolling press.”  
 “ The piece of wood or timber to be condensed must be passed  
 “ many times between the rollers, taking care to increase their  
 “ proximity and consequent pressure at each time of passing the  
 “ wood or timber, and to produce this increasing pressure by very  
 “ slow degrees, when it will be found that the sap or other  
 “ moisture previously contained in the wood will exude in very  
 “ considerable quantities from the ends of and sides of the piece,  
 “ and that it will give way and condense in its thickness without  
 “ any tendency to disturb the natural grain or texture of the  
 “ wood.” “ Wood so condensed becomes much heavier and  
 “ harder than similar wood without such treatment, and is conse-  
 “ quently less pervious to moisture,” “ less liable to decay, much  
 “ stronger,” “ has the important advantage of not shrinking by  
 “ becoming dry or heated,” &c.

[Printed, 3d. No drawings. See Repertory of Arts, vol. 1 (*third series*), p. 116, and London Journal (*Newton's*), vol. 11, p. 91.]

A.D. 1825, January 11.—N<sup>o</sup> 5078.

**BURNETT, WILLIAM SHELTON.**—“ A new method of lessening  
 “ the drift of ships at sea, and better protecting them in gales of  
 “ wind.” The invention consists in a resisting float or floated  
 ice-board, so arranged that when a ship or other vessel is fastened  
 “ to it at sea it will offer a resistance to her leeway, if under sail,  
 “ and will serve in some measure for an anchor to diminish her  
 “ drift way, if merely riding by it in a storm, and in a great mea-  
 “ sure prevent her falling off from the wind.”

The said float is constructed by securing a square piece of can-  
 vass in a frame, the upper side of which is a plank of wood, and  
 the other sides iron rods.

[Printed, 3d. Drawings. See Repertory of Arts, vol. 1 (*third series*), p. 277, London Journal (*Newton's*), vol. 12, p. 189, Mechanics' Magazine, vol. 8 p. 14, Register of Arts and Sciences, vol. 4, p. 273, also vol. 3, p. 185, and Engineers' and Mechanics' Encyclopedia, vol. 1, p. 287.]

A.D. 1825, March 15.—N° 5121.

**HANCOCK, THOMAS.**—"Improvement or improvements in the  
" making or rendering ships' bottoms, vessels, and utensils of  
" different descriptions, and various manufactures and porous or  
" fibrous substances, impervious to air and water, and for coating  
" and protecting the surfaces of different metallic and other  
" bodies."

No specification of this Patent was enrolled, but Mr. Hancock forwarded the following description of the invention to the Great Seal Patent Office on the 4th of January 1859:—

"The specification was intended to embrace the compounding  
" the liquid or original juice of caoutchouc, as mentioned in my  
" Patent of the 29th November, 1824, with vegetable or Stock-  
" holm tar, and some other vegetable matters, but Stockholm tar  
" principally, with the view of rendering the tar entirely or less  
" missible in water. This compound was to be used in cementing  
" fibrous substances into sheets for the purposes mentioned in the  
" title, and to render the other matters and things therein com-  
" prised more or less impermeable to air or water."

A.D. 1825, February 26.—N° 5108.

**BATEMAN, JONAS.**—A portable life boat or raft, consisting of two rectangular bodies, each composed of flat pieces of cork, about four feet three inches in length,  $7\frac{1}{2}$  inches in width, and  $7\frac{1}{2}$  inches in depth, enclosed in canvass, and placed between two pieces of board about half an inch thick, sufficiently large to completely cover the surface of the cork at the top and bottom. These are braced together on the lower side by two pieces of strong board, about 18 inches long and five inches wide, and one inch thick, to "act in  
" the double capacity of keeping the bodies of cork "sufficiently  
" apart to permit the persons using the boat to get between them,  
" and also as seats." A similar piece crosses the upper sides and is furnished with tholes. When the boat is not in use, it packs up into a rectangular body 4 ft. 3 in. long, about 18 in. broad, and one foot deep.

[Printed, &c. Drawings. See London Journal (*Newton's*) vol. 11, p. 175.]

A.D. 1825, June 28.—N<sup>o</sup> 5198.

REDMUND, DAVID.—To construct ships with all the timbers of the frame close jointed, and with adjacent timbers firmly bolted to each other, so that when the ships are in a state ready for planking they should be of sufficient strength to resist all such shocks or concussions as vessels are liable to meet with, otherwise such shocks or concussions are "received on or affect the treenails or" bolts which secure the planking to the frame of the vessel." All the timbers cross the keel, and are made smaller at the upper end than at the lower part next the keel. All the frames are "square," and those amidships vertical; the rest in both bodies incline towards midships at the head. The decks are to be formed solid, without beams, of transverse pieces of oak scantling 6 or 8 inches square, bolted together, and assisted by iron trusses wherever necessary. The same principle is to be applied to the construction of houses, &c.

[Printed 1s. Drawings. See Repertory of Arts, vol. 2 (*third series*), p. 198, London Journal (*Newton's*), vol. 12, p. 80, Mechanics' Magazine, vol. 16, p. 174, Register of Arts and Sciences, vol. 4, p. 193, and Engineers' and Mechanics' Encyclopedia, vol. 2, p. 649.]

A.D. 1825, August 10.—N<sup>o</sup> 5233.

CHARLETON, GEORGE, and WALKER, WILLIAM.—"Certain improvements in the building or constructing of ships and other vessels." According to this invention the ship is framed entirely with straight timber. The floor timbers are converted from a straight piece of timber, having two chocks under it, to make up the depth, and with two additional rising chocks one-fourth of its length at its outer ends. The futtocks are also made from straight pieces of timber; they have chocks at their heads and heels, and a truss timber on their backs to form the curve of the body. The top timbers are made from straight timber running in one length upwards from the futtock heads. The frames are secured and bolted in the midship body of the ship through three keels on the outside of the bottom; two side keels being let in and on the main keel; these are then backed with thick planks or garboard strakes.

The beam ends are secured to the side, without knees, by a broad shelf and waterway, and thick binding strakes; they butt against a plank which runs fore-and-aft the ship at the ends of the

beams, and prevents them from chafing and destroying their ends and the frame timbers. Thick stringers or planks, forming the hatch coamings, &c., run fore and aft on their edges, and are let up under, and down over the beams; they are secured to the stern timbers and transoms abaft, and to the hooks forward; the planks at the beam ends on both sides are also let down, and bolted through the side timbers, dividing the strain of the decks as it were into three separate divisions. To ventilate the frame timbers and beam ends, the beam ends and the chocks between them are gouged, forming a cavity fore-and-aft between the ship's frames and their ends; and ventilators are let into the sheer planks between the frame timbers, and also in the bows and stern of the ship. To prevent the cargo from damage, rising chocks are fitted on the floor timbers between the main and wing keelsons, and form, with the assistance of the inside planks, a flat surface on the hold; more room is thus given for water to lodge in between the timbers and the lower part of the bottom.

[Printed, 7d. Drawings. See Repertory of Arts, vol. 3 (*third series*), pp. 34 and 211; and London Journal (*Newton's*), vol. 13, p. 257.]

A.D. 1826, February 7.—N° 5329.

EVANS, HUGH.—“ A certain method or methods of rendering  
“ ships and other vessels, whether sailing or propelled by steam,  
“ more safe in cases of danger by leakage, bilging, or letting in  
“ water than as at present constructed,” consisting in the introduction of a safety hold, extending if possible the whole length of a ship or vessel along her bottom, and formed into several compartments by substantial bulkheads or partitions across the hold, and finally secured by a strong and complete orlop deck frame, planked above, well secured, and sheathed on the under side between the beams, the whole being caulked tight, and made in every respect fit to resist or bear the pressure of water that may come on either side of such bulkheads and orlop deck. The usual hatchways into the hold to be secured by double hatches fixed under as well as over the deck. Ships or vessels of a smaller class, and steam vessels, may be partially fitted on this plan.

[Printed, 1s. 1d. Drawings. See Repertory of Arts, vol. 3 (*third series*), p. 374; London Journal (*Newton's*), vol. 14, p. 313; and Register of Arts and Sciences, vol. 2 (*new series*), p. 20.]

A.D. 1826, February 25.—N° 5339.

**NEWMARCH, BENJAMIN.** "The adaptation of elastic shields  
" to be attached to the sides and to the bows of ships and of  
" smaller vessels, such as are employed for inland navigation, for  
" the purpose of taking off the effect of any sudden concussion."  
These shields consist of pieces of plank or board, having between  
them and the sides or bows of the vessels, helical springs or blocks  
of cork. "Similar shields may also be placed on the outsides of  
" fortifications and other places likely to be attacked by gun  
" shots." "The invention consists" further "in the adaptation  
" of a spring or springs connected to the axle of the fore wheels  
" of a gun carriage, which spring or springs, as the carriage runs  
" back, becomes wound up to considerable tension, and thereby  
" retarding the rotation of the wheels causes them to drag, and  
" the running back of the carriages to be greatly impeded, if not  
" effectually stopped." When the carriage is stopped, a pall takes  
hold of a ratchet wheel, and prevents the carriage from running  
forward again. The gun may then be reloaded, and on raising  
the pall so as to liberate the ratchet, the force of the coiled spring  
will impel the carriage into its proper position, ready for the next  
discharge.

[Printed, 8d. Drawings. See London Journal (*Newton's*), vol. 12, p. 123.]

A.D. 1826, April 27.—N° 5352.

**WILLIAMS, JOHN.**—"An improved ship's hearth," the im-  
provements in which consist in introducing an air channel between  
the back of the grate and the oven, and thus causing the air to  
circulate and become heated, and afterwards passing it through  
the oven or roaster; also in dividing the heat and flame from the  
fire, and causing it to heat either the oven or the boiler at pleasure;  
and in the introduction of two falling bars in the grate, so as to  
raise or lower the fire, and form a shelf upon which to support  
cooking vessels.

[Printed, 8d. Drawings. See London Journal (*Newton's*), vol. 14, p. 339.]

A.D. 1826, July 24.—N° 5395.

**PARSONS, WILLIAM.**—"Certain improvements in building  
" ships or vessels, which improvements are calculated to lessen

“ the effects of internal or external violence.” The object of this invention is to remedy the “ evident want of connection and unity “ in the frames of vessels, and to increase their strength at the “ joints.” This is effected in the following way:—Take the bends of timber at present in use, and keep them apart a parallel distance from each other, suppose three inches, then in all these openings between the bends introduce a connecting metal frame, made to the form of the bends, or nearly so. The connecting frame is to be made with a flanch or projecting rib one inch and a half square on each side. “ Both at the upper and lower edges a “ groove or rebate is taken out of each edge of each timber where “ the connecting frame is placed to receive the flanches or pro- “ jecting ribs.” These connecting frames may be made either solid or open, and without any flanches or projecting ribs, but with dowels or coaks projecting from each side, which dowels or coaks are to be sunk in the two adjacent timbers; or they may be made in two parts, one part to be put in from the inside, and the other from the outside; each part to be made with a kind of dovetail at the joint. “ I do not confine myself to any particular metal or “ material for the connecting frames, but the propriety of using “ cast iron is obvious, as it will answer the purpose of ballast;” moreover “ I do not confine the application of the connecting “ frames to the frame of the vessel only; it is applicable to “ beams, hooks, crutches, and various other purposes in forming “ connections.”

[Printed, 7d. Drawings. See Repertory of Arts, vol. 4 (*third series*), p. 422; also vol. 8 (*third series*), p. 705; and London Journal (*Newton's*), vol. 1 (*second series*), p. 164.]

A.D. 1826, December 20.—N<sup>o</sup> 5433.

HARSLEBEN, CHARLES.—To construct vessels fitted up with proper wells or receptacles for containing live fish, properly partitioned and separated from each other, communications to be made between them by large air and water-tight cocks or sliding valves, “ by which means I can either shut off the supply of water “ to the said wells or receptacles completely or entirely, or I can “ open the supply to any extent that may be desirable.” “ I “ occasionally make the partitions ” for dividing and separating the wells or reservoirs “ hollow or capable of containing a con- “ siderable quantity of air by forming the sides of the said wells “ or reservoirs of planks or metal plates, with a space between one

"reservoir and another; and these hollow spaces may, if found  
 "desirable, on account of leaks or otherwise, be fitted up with  
 "cork or other light and buoyant substances." Also improvements in propelling or moving ships or other vessels through the water, first, in "the application of a double revolving paddle," and, secondly, in "a moveable apparatus, which may be used in any  
 "watercourse, in which the water moves or flows either by the  
 "tide or otherwise, and which" "apparatus, being detached from  
 "the ship or vessel to be moved, will tow or draw the same along  
 "against the direction of the current, and may be also used and  
 "applied to many other purposes where powerful rotary motion  
 "is required."

[Printed, 8d. Drawings. See Repertory of Arts, vol. 6 (*third series*), p. 41; and London Journal (*Newton's*), vol. 3 (*second series*), p. 204.]

A.D. 1827, May 26.—N° 5499.

HOOD, WILLIAM JOHN THOMPSON—"Certain improvements  
 "on pumps, or machinery for raising or forcing water, chiefly  
 "applicable to ships." There is to be fitted under the lowest  
 deck "an oblong box, of nine feet in length, seven in breadth, and  
 "four feet deep externally." There are within this box or reservoir three partitions, one athwartships, which divides it into two equal compartments, the other two fore and aft in the after side from the athwartship partition, and so far apart as to admit of very little more space than is occupied by the top of the trunk or cylinder leading into the hold. Communication is made between these compartments by doors or valves, which can be easily removed from the deck. There are two barrels, in which solid pistons work, opening into the two smaller chambers, the pump valves leading from the larger chamber. The pistons are worked by a "stop-hinge chain," which passes over a sprocket wheel having a "semi-rotary" or reciprocating motion. Means are employed for converting this pump into a fire engine at pleasure.

[Printed, 8d. Drawings. See Repertory of Arts, vol. 7 (*third series*), p. 50, and London Journal (*Newton's*), vol. 4 (*second series*), p. 77.]

A.D. 1827, December 18.—N° 5590.

GEORGE, JOHN.—"For preserving decked ships or vessels, so  
 "as to render them less liable to the dry rot, and for preserving  
 "goods on board such ships and vessels from damage by heat."

To effect these objects, air trunks lead from the upper deck to different parts of the hold to admit a current of cold air, provision being made for carrying off the warm air displaced by it. To get rid of any gases heavier than atmospheric air, the inventor employs a pump or heating apparatus in conjunction with that above named.

The apparatus and machinery employed is “for causing and  
 “keeping up, when and as often as is requisite and the safety  
 “of the vessel will permit, a regulated supply, circulation, and  
 “change of the common air of the atmosphere in and through  
 “the interior, or any particular part of the interior” of vessels,  
 “causing heat to enter into or to pass off from the same in and  
 “along with such air for bringing and preserving the tempera-  
 “tures at the opposite sides of the timber of such vessels near to  
 “an equilibrium or the same temperature, and thereby preventing  
 “either wholly or as far as is practicable” “any considerable  
 “current or stream of heat, from penetrating the timber of such  
 “vessels on one side of the timber, and passing through its sub-  
 “stance and out of it at another side thereof, for the better  
 “preservation of such timber from the said premature decay and  
 “decomposition of timber, commonly called the dry rot, and also  
 “by so causing heat to pass off out of such vessels, for the better  
 “preservation of goods on board thereof, from damage by heat.”

[Printed, 10d. No drawings. See Repertory of Arts, vol. 8 (*third series*), p. 129, 193, and 257; and London Journal (*Newton's*), vol. 5 (*second series*), p. 326.]

A.D. 1828, August 11.—N<sup>o</sup> 5682.

FITZMAURICE, LEWIS ROPER.—“Certain improvements on  
 “ship and other pumps, which improvements are also applicable,  
 “by certain alterations, to turning lathes and other purposes.”  
 The inventor describes a wheel case through which the water is delivered. The fluid is drawn through this case by vanes, which move in a channel formed round a portion of the case, and which are feathered by springs, or in some other way, through the remaining part of the circle. The machine has to be filled with water before it can be worked. Then upon turning the handle the stream is uniform and continuous. The machine “may be  
 “converted into a turning lathe, where a small power only is  
 “required, by having a reservoir of water on the house-top, and  
 “a pipe leading from it.”

[Printed, 9d. Drawings. See Repertory of Arts, vol. 8 (*third series*), p. 666; and London Journal (*Newton's*), vol. 9 (*second series*), p. 108.]

A.D. 1828, September 4.—N° 5692.

**PATTISON, GRANVILLE SHARP.**—(*a communication.*)—The invention consists in attaching small portions of zinc plates, or zinc in some other form, to both sides of iron sheets, and in the application of the iron sheets so combined to the sheathing of ships and other vessels; so that the corrosion of such sheathing which otherwise would arise from its immersion in sea water may be thereby in a great measure, if not entirely, prevented. And also in the use of zinc washers, plates, or flat rings on the iron bolts, iron spikes, and iron nails used in the fastenings of ships, "so as thereby to prevent in a great measure, if not entirely, the corrosion which otherwise would arise from their immersion in sea water."

[Printed, 4d. No drawings. See Repertory of Arts, vol. 8 (*third series*), p. 307; and London Journal (*Newton's*), vol. 3 (*second series*), p. 247.]

A.D. 1829, May 23.—N° 5791.

**WILLIAMS, THOMAS ROBINSON.**—Improvements in the "making or manufacturing of felt, or a substance in the nature thereof, applicable to covering the bottoms of vessels, and other purposes." The inventor purposes to make felt by passing hair, wool, cotton, hemp, flax, or other fibrous substance between two wire webs immersed in a composition of melted tar, pitch, or other material, and subjecting it to pressure under rollers. "For the purpose of covering ships' bottoms and houses, a felt composed of hair immersed in a composition of tar and rosin, or tar and pitch, is preferable."

[Printed, 6d. Drawings. See Repertory of Arts, vol. 9 (*third series*), p. 29 and vol. 9 (*new series*), pp. 103 and 173; London Journal (*Newton's*), vol. 9 (*second series*), p. 174; Register of Arts and Sciences, vol. 4 (*new series*), p. 16; Webster's Patent Law, p. 137, Case 127; and Carmichael's Reports on Patent Cases, vol. 2, pp. 381 and 383.]

A.D. 1829, November 17.—N° 5872.

**DODGSON, JOHN WILLIAM.**—"Certain improvements in ships' scuppers, and which may be applied to other purposes." The invention consists in placing a valve at the inner end of the scupper tube, which shall open to allow water to pass out of the ship, and close again by its own weight.

[Printed, 5d. Drawings. See Repertory of Arts, vol. 9 (*third series*), p. 338; London Journal (*Newton's*), vol. 9 (*second series*), p. 306; and Register of Arts and Sciences, vol. 5 (*new series*), p. 11.]

A.D. 1830, January 28.—N° 5892.

**REVERE, JOHN.**—"A new alloy or compound metal applicable  
"to the sheathing of ships, and various other useful purposes."  
It consists of zinc and copper combined in the following proportions, viz., "zinc ninety-five parts, copper five parts, by weight." The inventor claims to have discovered that "when zinc has, as  
"above described, a small quantity of copper combined with it,  
"its liability to corrode is materially diminished, and that the  
"compound metal thus formed may advantageously be employed  
"for sheathing ships and other various useful purposes."

[Printed, 3d. No drawings. See London Journal (*Newton's*), vol. 5 (*conjoined series*), p. 119; and Register of Arts and Sciences, vol. 5 (*new series*), p. 98.]

A.D. 1830, February 4.—N° 5895.

**GRAY, JOHN.**—"A new and improved method of preparing and  
"putting on copper sheathing for shipping." The inventor claims, "the piercing of countersunk nail holes in copper sheath-  
"ing" by means of certain machines or tools described, before the copper is fastened to the vessel. The heads of the nails by which the sheathing (so prepared) is to be put on, "being re-  
"ceived and lodged into the said countersinks will make a flush  
"or even surface with the outside of the sheathing without pro-  
"jection or indentation."

[Printed, 7d. Drawings. See Repertory of Arts, vol. 9 (*third series*), p. 292; London Journal (*Newton's*) vol. 2 (*conjoined series*), p. 30; and Register of Arts and Sciences, vol. 4 (*new series*), p. 292.]

A.D. 1830, April 24.—N° 5929.

**BROWN, SAMUEL.**—"Certain improvements in making or  
"manufacturing bolts and chains." The improvement in the manufacturing of chains consists in cutting the links from improved bolts, instead of from bolts of uniform thickness. These improved bolts are formed with "a swell or boss on the bolt at  
"the part which is to be cut into the scarf for welding or shutting.  
"The length of this swell or boss is to be three times the diameter  
"of the iron, of whatsoever size is used, between the termination  
"of the swells or bolts, one-eighth of an inch thicker in all sizes  
"than that part of the bolt between the bosses." "By this means  
"the links are increased in size, and consequently in strength,

“ both in the centre of shut and point of the scarf, and this side  
 “ of the link, which was almost invariably weaker than the  
 “ opposite or manufactured side, becomes as near as possible of  
 “ equal strength.”

[Printed, 11d. Drawings. See Repertory of Arts, vol. 10 (*third series*), p. 335, London Journal (*Newton's*), vol. 7 (*second series*), p. 321, and Register of Arts and Sciences, vol. 5 (*new series*), p. 195.]

A.D. 1830, April 24.—N<sup>o</sup> 5932.

COOK, THOMAS.—“ Certain improvements in the construction  
 “ and fitting up of boats.” These improvements consist in converting all that part of the boat which lies below the thwarts into a watertight compartment by means of a canvass cover, which may be screwed down temporarily at the height of the thwarts; openings are made in it, surrounded by bags to receive the legs of the rowers. The inventor proposes to form fenders of canvass bags filled with cork, and to lash them along the outside of the gunwale of the boat to assist the stability. He also describes a mode of attaching iron bars temporarily to the sides of the keel to form ballast, and some hooks for disengaging boats' sheets, gripes, and tackle blocks with ease.

[Printed, 1s. 1d. Drawings. See Repertory of Arts, vol. 2 (*new series*), p. 5, London Journal (*Newton's*), vol. 1 (*conjoined series*), p. 291, and Register of Arts and Sciences, vol. 3 (*new series*), p. 85.]

A.D. 1830, July 6.—N<sup>o</sup> 5952.

UZIELLI, MATTHEW —(*a communication*)—“ The invention  
 “ consists in giving ductility and malleability for the purpose of  
 “ making it into sheets, to an alloy composed of copper and tin  
 “ solely, or which is so far free from the admixture of zinc or lead  
 “ as to be harder and less liable to oxidation than pure copper or  
 “ common sheet brass.” This alloy is brittle when first cast, but by casting it in thin plates, heating and cooling them very gradually, and rolling them cold, very gently at first and always in the same direction, it “ is thereby made into malleable and  
 “ ductile sheets, which from their being less liable to oxidation  
 “ than pure copper are therefore more applicable to the sheathing  
 “ of ships for covering roofs of buildings, making spouts and  
 “ gutters, and other purposes where sheets are required which  
 “ will not be liable to much oxidation.” The proportions which

have been found best adapted for these purposes are one hundred of copper, with five to seven of tin.

[Printed, 3d. No drawings. See Repertory of Arts, vol. 11 (*third series*), p. 269; London Journal (*Newton's*), vol. 7 (*second series*), p. 280; and Register of Arts and Sciences, vol. 5 (*new series*), p. 272.]

A.D. 1830, August 5.—N° 5968.

DOBREE, WILLIAM.—“An independent safety boat of novel construction.” “Its novelty of construction, as well as claim to the title independent safety boat, consists in a separation of that part of the boat containing the passengers and crew from the hull, with attached self-supplying water ballast chamber. The connecting link between the two divisions is formed of double concave beams, or cross pieces resting upon the convex surface of the hull deck. The upper concavity of the said beam is designed to receive the upper deck.” Thus any water which may be shipped and received in this division will “by reason of a gentle inclination from the sides, be entirely discharged through an opening for such purpose in the center of the upper deck, and passing on either side over the convex surface of the hull deck through the numerous spaces between the beams or cross pieces,” will eventually escape out of small holes in the sides in midships. The hull division, above the cover of the ballast chamber, comprises numerous air-tight compartments, within which a number of distinct air vessels of wood and copper are enclosed.

[Printed, 6d. Drawings. See London Journal (*Newton's*), vol. 3 (*conjoined series*), p. 300; Mechanics' Magazine, vol. 15, p. 46; and Register of Arts and Sciences, vol. 5 (*new series*), p. 278.]

A.D. 1830, August 5.—N° 5976.

CLOUGH, ROBERT.—“An improved supporting block to be used in graving docks, and for other purposes.” The block is composed of four pieces, the upper and lower of which are alike; the two intermediate pieces are also alike, and wedge shaped. It is held together by iron clasps “in such manner as to be easily taken to pieces without injuring the parts, and thus removed from under any superincumbent weight without previously raising such weight;” and “is applicable to various purposes, such as graving blocks for supporting ships while

" under repair, fids for supporting ships' upper masts, building  
 " blocks for a temporary support to any part of a building while  
 " under repairs," &c.

[Printed, 5d. Drawings. See London Journal (*Newton's*), vol. 3 (*con-joined series*), p. 251; Register of Arts and Sciences, vol. 3 (*new series*), p. 300; and Mechanics' Magazine, vol. 15, p. 61.]

A.D. 1830, September 21.—N<sup>o</sup> 6000.

CHURCH, WILLIAM — This invention consists in substituting  
 " thin metallic plates or sheets, formed into wavy, fluted, furrowed,  
 " or otherwise corrugated surfaces, in lieu of the ordinary materials  
 " employed in building the hulls of vessels " and boats; and connect-  
 " ing the same together for the purpose of forming the hulls  
 " and decks, and also with plain sheets of metal or planks of wood,  
 " by riveting, bolting, seaming, soldering, or by any other con-  
 " venient means, in such way as to enclose permanently portions  
 " of air in the interstices formed by the indentations or furrows  
 " of the metallic sheets or plates, and thus give greater buoyancy,  
 " duration, and strength to such parts of any vessel constructed  
 " with them than can be obtained from the use of timber or plates  
 " of metal of equal weight, which have no interstices."

[Printed, 6d. Drawings. See London Journal (*Newton's*), vol. 7 (*second series*), p. 270; Register of Arts and Sciences, vol. 6 (*new series*), p. 42; and Rolls Chapel Reports, 7th Report, p. 133.]

A.D. 1830, December 6.—N<sup>o</sup> 6045.

BROWN, SAMUEL — The invention consists in improvements in  
 the means of drawing up vessels along inclined planes or ways,  
 in order to transfer them from the water to the dry land; and  
 also in other improvements for transporting vessels so drawn up  
 upon stone tracks, or level or inclined ways extending from one  
 place to another across the country in the manner of railroads.  
 These inclined planes or ways must be laid out " by the side of  
 " the water, with a gentle slope down into the water, and extend-  
 " ing low enough therein to permit a ship or other vessel to be  
 " floated over a suitable cradle or carriage." Three parallel lines of  
 stone tracks or ways are to be laid along the inclined slips for the  
 said carriage to move upon; and " one of my improvements on  
 " what has been hitherto used in such slips or inclined ways  
 " consists in applying systems or chains of moveable rollers to  
 " roll along the said stone ways, and to bear the said carriage or

“ cradle, in lieu of wheels or trucks moveable upon axles. The  
“ said rollers may be made of cast iron from one to two feet  
“ diameter, and made double, each one being composed of two  
“ rollers, one at the end of the other, united by a central axis,  
“ leaving a narrow space between their adjacent ends, in order to  
“ admit the joining link of the connecting chain between them;  
“ also an iron rail, which is fixed edgeways upwards along the  
“ middle of the centre stone way, and which keeps the pair of  
“ double rollers in its place on the stone. A series of these double  
“ rollers are laid on each of the three stone ways in a row, at  
“ distances of about eight or ten feet apart, and reaching from  
“ the commencement of the slip below low water to half the  
“ distance up the inclined ways. The axles of all the double  
“ rollers are retained at their intended distances apart by iron rods  
“ or links, which unite them into three continuous chains of rollers.  
“ The timber work of the carriage or cradle on which the ship or  
“ vessel is to be placed is framed upon three very strong beams,  
“ which extend all the length of the carriage, and are exactly over  
“ the three stone ways.” “The carriage is drawn up the inclined  
“ ways by purchase capstans or other suitable machinery.” For the  
purpose of moving the vessels laterally, a transverse way is formed  
across the top of the inclined plane, with a number of parallel  
horizontal stone ways laid along the same in a direction at right  
angles to the stone ways on the inclined plane. The ship is drawn  
upon these side ways by means of a carriage which forms a part of  
the first inclined plane, and is itself moveable transversely on  
rollers. That part of the invention which relates to transporting  
vessels on land, consists in transferring them, together with the  
carriages on which they are placed, to another suitable carriage for  
travelling along suitable level roads, laid with stone ways, such as  
before described, but laid across the country in the manner of  
railroads.

[Printed, 2s. 1d. Drawings. See London Journal (*Newton's*), vol. 8 (*con-joined series*), p. 431; and Register of Arts and Sciences, vol. 6 (*new series*), p. 105.]

A.D. 1831, January 22.—N<sup>o</sup> 6063.

SMITH, ANDREW.—The invention consists in a “peculiar con-  
“ struction of the paddles for propelling vessels designed to  
“ obviate the lifting of the backwater;” and “in the construction  
“ of boats or vessels for carrying propelling machinery intended

“ for inland navigation, by which the surge or motion of the  
 “ water caused by the action of the paddles is kept or directed  
 “ in the middle of the canal, or in a direct line with the way of  
 “ the boat or vessel, until it has partly subsided, so as to prevent  
 “ injury to the banks or sides of the navigation.” For this  
 latter purpose the paddles are placed at the stern part of the  
 vessel amidships, in a short channel or chamber open to the water  
 at the bottom; and to confine the surge of the water in a line  
 with the way of the vessel, the inventor attaches to the sides of  
 the stern part of the boat long guides or conductors, which are  
 formed of sail cloth or other strong flexible material distended  
 by small rods. These guides are kept perpendicular by the lower  
 ends of the rods being weighted by small balls of lead or other  
 heavy substance; and by pieces of cork, floating on the surface of  
 the water.

[Printed *ib. id.* Drawings. See London Journal (*Newton's*), vol. 7 (*second series*), p. 305; Register of Arts and Sciences, vol. 6 (*new series*), p. 167, and Kells Chapel Reports, 7th Report, p. 134.]

A.D. 1831, March 31.—N° 6102.

WALLACE, JOHN.—The improvements consist in “ the applica-  
 “ tion of a smoke jack to the chimney or flue of a safety hearth,  
 “ and ” in “ other additions whereby such safety hearth is made  
 “ capable of roasting by means of the power derived from such  
 “ smoke jack.”

Secondly, in placing or mounting a safety hearth on a curved  
 railway, whereby it will be kept in its perpendicular position in  
 case of the heeling of the ship or vessel.

Thirdly, in the application of a damper and double flue,  
 whereby the fire and flame may be shut off from the boilers or  
 ovens when not in use.

[Printed, *ibid.* Drawings. See Repository of Arts, vol. 13 (*third series*),  
 p. 78 also vol. 1 (*new series*), p. 334, London Journal (*Newton's*), vol. 8  
 (*unjoined series*), p. 406, and Register of Arts and Sciences, vol. 6,  
 p. 234.]

A.D. 1831, July 6.—N° 6129.

WETTERSTEIT, BARON CHARLES.—“ A composition or  
 “ combination of materials for sheathing, painting, or preserving  
 “ ships' bottoms, and for other purposes.” The metal to be

rolled into sheets consists of one hundred parts of lead melted with from three to ten per cent. of "antimony metal." These sheets may be painted on both sides before the final rolling, with an amalgam consisting of about two parts of lead, one part of antimony metal, and about seventeen parts of quicksilver. "For the purpose of painting or covering wood, metal, and other materials, which are exposed to wet or damp," a composition is made consisting of equal parts of the dross or skimmings of melted lead, and of sulphur melted together. The "mixture when cold and pulverized is to be laid on to the surface of the wood, metal, or other material by the aid of a flat hot iron, or by heating the materials on which it is to be laid, avoiding having sufficient heat to set fire to the sulphur."

[Printed, 3d. No drawings. See Repertory of Arts, vol. 13 (*third series*), p. 139; London Journal (*Newton's*), vol. 1 (*conjoined series*), p. 421, and vol. 10 (*conjoined series*), p. 179; Mechanics' Magazine, vol. 17, p. 381; and Register of Arts and Sciences, vol. 7 (*new series*), p. 11.]

A.D. 1831, September 24.—N<sup>o</sup> 6167.

WERNINCK, HENRY HOPE.—(*a communication.*)—"Improvements in apparatus or methods for preserving lives of persons and property when in danger by shipwreck or otherwise, by speedily converting boats or small vessels of ordinary descriptions into life boats, and other apparatus or means applicable to the same objects." The inventor describes, first, a "floating balloon" made of ox bladders, &c., "for the purpose of obtaining communication between a stranded ship and the shore."

"Secondly, a kind of jacket or apparatus," called a scaphander, "which when fastened round a man's waist renders him a floating body."

Thirdly, "the safety vest" for the same purpose as the scaphander.

Fourthly, a means of "speedily converting boats or small vessels of ordinary descriptions into life boats" by attaching to them small floats consisting of rushes enclosed in waterproof material.

Fifthly, a "life preserver or escape buoy," also formed of rushes covered with waterproof coating.

Sixthly, a "drop safety buoy or life preserver."

Seventhly, "the Uter Intelligentiæ, or Bladder of Intelligence," to enable the crew of a ship wrecked or in distress to give intelligence of their situation to the inhabitants of the coast, &c.

Eighthly, "the floating horse harness," which is made of the same material as the floating power for the scaphander, boats, &c., viz., rushes made water-tight.

[Printed, 1s. 3d. Drawings. See Repertory of Arts, vol. 18 (*third series*), p. 272, London Journal (*Newton's*), vol. 11 (*conjoined series*), p. 152, and Register of Arts and Sciences, vol. 7 (*new series*), p. 97.]

A.D. 1832, June 22.—N° 6278.

GARSED, EDWARD, and ROBINSON, ALFRED.—"Improvements in apparatus for heating, warming, and ventilating drying houses, rooms, buildings, ships, and mines," consisting "in the peculiar construction of a stove or furnace with air passages, by which we are enabled to obtain a very rapid circulation of air, heated to any degree of temperature that may be desired, for the warming of apartments," &c. "This apparatus is formed by the arrangement of several series of hollow tubes, through the interior of which the atmospheric air is allowed to pass while the external surfaces of the said tubes are acted upon by the flames and heated vapours of the furnace and flues by which they are surrounded."

[Printed, 8d. Drawings. See London Journal (*Newton's*) vol. 2 (*conjoined series*), p. 49, and Rolls Chapel Reports, 7th Report, p. 130.]

A.D. 1832, October 22.—N° 6325.

MUNTZ, GEORGE FREDERICK.—An improved "manufacture of metal plates for sheathing the bottoms of ships or other such vessels." The invention consists in making the "plates for sheathing of an alloy of zinc and copper, in such proportions and of such qualities as, while it enables the manufacturer to roll the said compound metal into plates or sheets fit for the said sheathing at a red heat, and thus makes the said plates or sheets less difficult to work, and consequently cheaper to manufacture, renders the said sheathing less liable to oxydation, and consequently more durable than the ordinary copper sheathing now in use, though at the same time it oxydates sufficiently to keep the bottom of the vessel clean." "I take that quality of copper known in the trade by the appellation of 'best selected

“ ‘copper,’ and that quality of zinc known in England as ‘foreign  
 “ ‘zinc,’ and melt them together in the usual manner, in any pro-  
 “ portions between fifty per cent. of copper to fifty per cent. of  
 “ zinc, and sixty-three per cent. of copper to thirty-seven per cent.  
 “ of zinc, both of which extremes and all intermediate proportions  
 “ will roll at a red heat,” but “ I prefer the alloy to consist of  
 “ about sixty per cent. of copper to forty per cent. of zinc.”

[Printed, 3d. No drawings. See Repertory of Arts, vol. 15 (*third series*), p. 325, and vol. 17 (*new series*), p. 116; London Journal (*Newton's*), vol. 3 (*conjoined series*), p. 212, vol. 19 (*conjoined series*), p. 460, vol. 21 (*conjoined series*), p. 468, and vol. 24 (*conjoined series*), pp. 297 and 299; Mechanics' Magazine, vol. 39, p. 367, and vol. 40, p. 111; Record of Patent Inventions, vol. 1, p. 339; Carrington and Kirwan's Reports, vol. 3, p. 297; Dowling and Lowndes' Reports, vol. 1, pp. 24 and 737; and Jurist, vol. 7, p. 121.]

A.D. 1832, December 17.—N<sup>o</sup> 6347.

MUNTZ, GEORGE FREDERICK.—“ An improved manufac-  
 “ ture of bolts and other the like ships' fastenings.” The  
 invention consists in making such fastenings of “an alloy of  
 “ zinc and copper, in such proportions and of such qualities as  
 “ while it enables the manufacturer to roll and work the said  
 “ compound metal into bolts and other the like ships' fastenings  
 “ at a red heat, and thus makes” such “fastenings less difficult  
 “ to work, and consequently cheaper to manufacture, renders”  
 them also “ less liable to oxydation, and consequently more  
 “ durable than the ordinary bolts and other the like ships' fas-  
 “ tenings now in use.” “ I take that quality of copper known in  
 “ the trade by the appellation of ‘best selected copper,’ and that  
 “ quality of zinc known in England as ‘foreign zinc,’ and melt  
 “ them together in the usual manner in any proportions between  
 “ fifty per cent. of copper to fifty per cent. of zinc, and sixty-  
 “ three per cent. of copper to thirty-seven per cent. of zinc, both  
 “ of which extremes and all intermediate proportions will roll and  
 “ work at a red heat,” but “ I prefer the alloy to consist of about  
 “ sixty per cent. of copper to forty per cent. of zinc.”

[Printed, 3d. No drawings. See Repertory of Arts, vol. 16 (*third series*), p. 12; and London Journal (*Newton's*), vol. 3 (*conjoined series*), p. 83.)

A.D. 1833, February 21.—N<sup>o</sup> 6388.

HEBERT, LUKE, and DON, JAMES.—“ Certain improvements in  
 “ engines and other machinery employed in the constructing of

“ steam vessels and steam carriages, a portion of which improvements is applicable to other purposes. The invention consists,—  
 “ First, in improvements applicable to rotary steam engines, whereby the same are rendered capable of working with less friction, and at the same time more steam-tight than those heretofore constructed.”

Secondly, in various arrangements of tubular boilers applicable to generating steam for working the improved rotary engines, or to generating steam for other purposes.

“ Thirdly, in a means of more quickly withdrawing steam from behind the piston.”

[Printed, 1s. 11d. Drawings. See London Journal (*Newton's*), vol. 15 (conjoined series), p. 227.]

A.D. 1833, July 4.—N<sup>o</sup> 6446.

MITCHELL, ALEXANDER.—The invention consists in “ the formation of a graving dock with a buoyant ” flooring, “ which being held down by any suitable contrivance at its level of low water in a tideway, when desired can be subsequently liberated so as to rise and fall with the tide, and to carry upon it the ship or vessel to be repaired or built.” The buoyancy of the floor is to be obtained by the means of hollow air-tight vessels or caissons, or simply from the specific gravity of the materials employed in its construction being less than that of the supporting medium. The flooring is to be retained in its situation and guided in its rise and fall by piles, or to be controlled and regulated by means of mooring chains or cordage. To the lower end of such piles, a broad metal screw or worm is applied, for the purpose of enabling them to be inserted in or extracted from the ground, by causing them to turn upon their axes by means of cross levers. The inventor claims piles, pins, or shafts, so armed with broad metal worms or screws, whether the same be thus employed in the construction of a dock, “ or for piling ground for the support of buildings or embankments, or to obtain a secure hold of the ground for the purposes of mooring or holding fast ships and other floating or stationary bodies.”

[Printed 1s. 11d. Drawings. See Repository of Arts, vol. 1 (*new series*), p. 69, also vol. 10 (*enlarged series*), p. 116; London Journal (*Newton's*), vol. 15 (*conjoined series*), p. 12, and vol. 36 (*conjoined series*), p. 756; Mechanics Magazine, vol. 23, pp. 154 and 239; Patent Journal, vol. 3, p. 12, and Engineers' and Architects' Journal, vol. 1, p. 22, vol. 3, p. 151, and vol. 12, p. 33.]

A.D. 1833, December 21.—N<sup>o</sup> 6534.

**KYAN, JOHN HOWARD.**—"A new combination of machinery to  
" be applied to the present purposes of steam navigation in aid of  
" or in substitution for the motive power hitherto and at present  
" obtained and afforded by the application of steam." The  
invention consists "in expelling water received in a ship or vessel  
" for that purpose by means of pistons or pumps, the area of the  
" cylinders of which, and the length and velocity of the stroke of  
" the pistons of which, are so regulated with reference to the  
" diameter of the pipes through which the water is to be ejected  
" at the stern of the vessel, that the vessel may be propelled with  
" any necessary velocity by the action of the expelled water  
" against the water in which the ship or vessel floats."

[Printed, 6*d.* Drawings. See London Journal (*Newton's*), vol. 6 (*conjoined series*), p. 105.]

A.D. 1834, April 17.—N<sup>o</sup> 6594.

**WILLIAMS, WILLIAM, and HAY, THOMAS.**—"Improvements  
" in preparing certain metals applicable to the sheathing of the  
" bottoms of ships and other purposes," consisting "in preparing  
" the metal commonly called zinc or spelter, and the metal  
" called tin, by coating thin flat plates of laminated zinc or spelter  
" with a very thin superficial covering of tin," "and the plates of  
" laminated zinc so prepared by tinning (on one or both sides, as  
" may be thought most suitable), will be applicable to the sheathing  
" of the bottoms of ships in lieu of the copper plates hitherto  
" commonly used for that purpose;" or "to the purposes of  
" covering roofs in lieu of plates of lead or of copper or otherwise  
" for gutters, or for spouts of roofs," "in any of which applica-  
" tions the preparation of the zinc by the coating of tin will  
" preserve the zinc from oxydation."

[Printed, 5*d.* No drawings. See Repertory of Arts, vol. 3 (*new series*), p. 290; and London Journal (*Newton's*), vol. 7 (*conjoined series*), p. 130.]

A.D. 1834, November 3.—N<sup>o</sup> 6706.

**HEARLE, JOHN.**—The invention consists "in inclosing lift or  
" forcing pumps in a vessel capable of being made airtight, in  
" such manner as to afford great protection to the machinery at  
" the same time that the said vessel answers the purpose of an air

"chamber, when the pumps are required to be used as force pumps or for other purposes," and in an arrangement of brakes and levers, by which the engine may be used as a lift or force pump at pleasure.

[Printed, 9d. Drawings. See Repertory of Arts, vol. 5 (*new series*), p. 216; London Journal (*Newton's*), vol. 20 (*conjoined series*), p. 454, and Mechanics' Magazine, vol. 30, p. 177.]

A.D. 1834, November 25. —N° 6723.

COUCH, JAMES.—"Certain improvements in ships' channels." It is proposed to provide additional fastening for the chain plates to dead-eyes by driving a bolt through each at the height of the channel, so that in case of the mast being carried over the ship's side, "the landyard" may readily be got at to be cut away, which is not the case when the bolt does not pass through the chain plate in such manner as to retain the chain plate securely to the ship's side, "and thus retain the dead-eye in such a position as to be readily got at." Solid chocks are also to be worked under the channels as far as the faces of the chain plates, that in the event of a ship being struck by heavy seas, the channels may not be liable to be blown up, and that the solid channels may become fenders, and protect the sides of the ship.

[Printed, 9d. Drawings. See Repertory of Arts, vol. 4 (*new series*), p. 62, and London Journal (*Newton's*), vol. 7 (*conjoined series*), p. 371.]

A.D. 1834, November 25. —N° 6724.

SLADE, JACOB TILTON.—"An improved metallic sheathing for the bottoms of ships and vessels," consisting of plates of copper and lead united, so as to compose single sheets, copper on one side and lead on the other.

[Printed, 3d. No drawings. See London Journal (*Newton's*), vol. 19 (*conjoined series*), p. 16.]

A.D. 1834, December 23. N° 6736.

STOTHERT, HENRY.—An invention relating "to the apparatus usually known as ship's hearths or calouses intended for cooking provisions and supplying fresh water on board of ships and vessels at sea," and consisting in collecting so much of the steam as "is condensed by the process of cooking, and preventing

“ the same falling back and admixing with the salt water or other  
 “ impure water in the lower part of the boiler.”

[Printed, 9d. Drawings. See London Journal (*Newton's*), vol. 21 (*conjoined series*), p. 54.]

A.D. 1835, August 26.—N<sup>o</sup> 6892.

HIGGINS, JOHN LANE.—The inventor proposes to form sliding keels of circular wheels, sliding up and down, as occasion may require, in narrow trunks, in the middle line of the vessel. He also describes “a sliding rudder passing up and down in a case or  
 “ pair of cheeks.” “For vessels designed to be propelled by  
 “ steam or manual labour,” he proposes “to have a double vessel,  
 “ or a run through the middle of a vessel to about the line of the  
 “ draft of water,” with a trunk of about five or six feet in length, “in which is suspended a double wheel or pair of wheels  
 “ with one or more paddles.” He also describes “a windlass for  
 “ raising the masts of barges or other vessels which have to pass  
 “ under bridges,” and a windlass for raising anchors with chain cables.

[Printed, 8d. Drawings. See Repertory of Arts, vol. 6 (*new series*), p. 165; and London Journal (*Newton's*), vol. 9 (*conjoined series*), p. 231.]

A.D. 1837, February 6.—N<sup>o</sup> 7297.

GEMMELL, JOHN.—These improvements consist, first, in giving certain new forms and additions to paddles and paddle wheels.

Secondly, “in the application of the propelling machinery, of  
 “ whatever description, on the outsides instead of the inside or  
 “ middle” of twin or tube vessels; also to the application of a connecting fender to twin vessels, so as to form one bow.

Thirdly, in the construction and application of a nautical machine denominated “Gemmell's Marine Vehicle,” for the purposes of buoying up and tugging, or otherwise facilitating the passage of vessels and other objects that are so deeply laden as to be incapable of passing through shallow waters. This vehicle is a double-cased vessel of sufficient capacity to hold a ship. It is made of “malleable iron plates seamed and rivetted together.” In each side or wing of the double case is fixed a high-pressure engine of the horizontal kind, giving motion to two force pumps, which alternately receive water from the inside of the vehicle at each upstroke, and expel it at each downstroke, thus propelling

the vehicle. Or the vehicle may consist "of two lateral vessels constructed of wrought iron" placed, one on each side of the ship, "and connected to each other by chains or cables passing underneath the hull; and instead of the pumping and propelling mechanism being contained in the marine vehicle as before, they are contained in a steam tug vessel."

The vehicle may also be used as a floating bath.

Fourthly, the invention consists in the application of additional paddle wheels to the sides of vessels, and "in the employment of horizontal steam cylinders having the piston rods working through each end of the cylinder for the purpose of propelling vessels, also in the peculiar construction of the air pump for said purposes."

[Printed, 1s. 4d. Drawings.]

A.D. 1837, April 4.—N° 7334.

LAURAS, MICHAEL BERAND.—"Certain improvements in steam navigation"

[No Specification enrolled.]

A.D. 1837, June 19.—N° 7396.

YETTS, WILLIAM.—The invention consists in "the introduction or application of a thread or other conveniently formed piece of caoutchouc or indian-rubber, either in its native or manufactured state, into, upon, or over such seams or parts of ships and other vessels as require or may be benefitted by what is usually called caulking or rendering water-tight, the elasticity of which indian-rubber, particularly in hot latitudes, when the seams are most open, and the ordinary oakum most defective and inefficient, causes the leakage consequent thereon to be more effectually prevented than by any plan now adopted for that purpose."

[Printed, 3d. No drawings.]

A.D. 1837, July 19.—N° 7406.

DRAKE, JOHN POAD.—The invention consists in the "application of material on the principles of the arch or truss," in the construction of "barges, vessels, and boats of every description

“ for the navigation of rivers, canals, and sea purposes.” “ Al-  
“ though the double-boarded systems which have already been  
“ patented possess to a certain extent the advantages of those  
“ plans of which I am the author, such advantages may be con-  
“ sidered more as a matter of accident than otherwise, as neither  
“ of the two individuals (Annesley and Fouché), whose patents have  
“ expired, seem to have had any other idea than that of super-  
“ seding thick timber in the construction” of vessels. They  
ought to have seen that “ there was not the slightest necessity for  
“ constructing vessels with more than two thicknesses ; in fact,”  
“ that less than two thicknesses would answer every purpose.”  
They might thus have avoided “ the disadvantages of decay” in  
“ material so confined as a great portion of that used in such  
“ construction must” be, and also the great “ difficulty of re-  
“ pairing.” The inventor does not state in every case what por-  
tions of the arrangements shown in the drawings are claimed by  
him. The following improvements are, however, described as his  
own. In the “ radiated plan” the inside timbers may be made  
of “ the same thickness as the outside plank, and brought to  
“ shape by the same process as is generally used in building ; to  
“ be radiated from”  $20^{\circ}$  to  $75^{\circ}$  inclusive, “ and planked outside in  
“ a longitudinal direction ;” “ the inside bottom or ceiling to run  
“ diagonally.” In the “ diagonal plan” the “ bottom and sides  
“ are made of two thicknesses diagonally, as near the angle”  
 $45^{\circ}$  “ as possible. The partitions and deck to be made the same  
“ as the bottom and sides.” In the “ trussed plan,” instead of  
“ timbers at right angles with the plank, a trussed framing” is to  
be introduced, “ the same thickness as the plank outside, which  
“ is to run in a longitudinal direction.” In the “ trussed plan  
“ with iron” “ the timbers are superseded by an iron truss, to be  
“ introduced inside the outside plank, to run both in the bottom  
“ and sides longitudinally” “ An iron radiated principle may  
“ be introduced instead of wood.” “ Instead of metal, the fasten-  
“ ing generally” is to be made of wood, and is to consist of  
“ wood screws” or of “ dovetailed” pins or treenails. For the  
treenails the hole in each thickness of planking is to be counter-  
sunk, and the treenail is to have a conical head, and is to be  
secured or caulked by a wedge forced into its point after it is  
driven. “ The dovetailed treenail for fastening thick timber  
“ together is to be made parallel the whole thickness of the timber

" in ships, and dovetailed only for the thickness of the plank." The wood screws are to be used either with or without counter-sunk holes for the heads. A plan is described for steering shallow vessels with a sweep instead of a rudder, and also a plan " for trussing the rudder of river craft, by which the stress on the part will be relieved and its action made easier."

[Printed, 4s. 3d. Drawings.]

A.D. 1837, November 16.—N° 7479.

FOURNESS, WILLIAM.—" A certain improvement or improvements in ventilating pits, shafts, mines, wells, ships' holds, or other confined places." The improvements in ventilating pits, shafts, mines, wells, ships' holds, or other confined places, consist in a peculiar construction of apparatus adapted to such purposes, and in the application of a rotary fan thereto as an exhaustor to draw the foul air therefrom."

[Printed, 1s. 6d. Drawings. See London Journal (Newton's), vol. 13 (continued series), p. 37.]

A.D. 1837, November 16.—N° 7480.

BUCKINGHAM, JAMES.—" Improvements in ventilating mines, ships' holds, and other confined places," consisting " of three improved arrangements, constructions, and adaptations of apparatus for exhausting or extracting the foul air and deleterious and inflammable vapours therefrom, thereby allowing fresh atmospheric air to descend and supply the partial vacuum thus formed; the first of which consists in the adaptation of a rotary fan or blower contained in a close casing, which fan as it revolves draws or exhausts the air by means of an exhausting pipe, one end of which is open at that part of the mine which is required to be ventilated, or the foul air removed, and the other end is open to the apparatus only. The second arrangement, construction, and adaptation of apparatus is a double-acting bellows for gaining a continuous draught. The third improved construction and arrangement of apparatus is a rotary fan wheel or blower having its fans placed in an oblique direction to its axis, which fan wheel is enclosed in a box or case at the top or the end, or any other convenient part of the

“ draught pipe, such oblique fans exhausting and forcing the  
“ foul air.”

[Printed, 6d. Drawings. See London Journal (*Newton's*), vol. 12 (*con-joined series*), p. 341.]

A.D. 1837, December 19.—N<sup>o</sup> 7517.

PITCHER, WILLIAM HENRY.—(*a communication.*) —“ Im-  
“ provements in the construction of docks and apparatus for  
“ repairing ships and vessels.” The inventor proposes to con-  
struct a wet dock or basin of about the same dimensions as an  
ordinary dry dock, and to hang across it, by chains, several beams  
strong enough to take the weight of a ship. On both sides of  
the dock there is a horizontal frame, to which the ends of the  
chains on each side, after passing round pullies, are attached.  
Each of these frames is capable of sliding along in the direction of  
its length, and thus raising the beams suspended by the chains.  
Motion is given to the frames by hydraulic presses, which are  
stationed one on each side of the head of the dock, and which are  
worked by a pump placed between them. When the ship to be  
raised is hauled over these beams, she is secured by shores  
of a peculiar construction.

[Printed, 9d. Drawings.]

A.D. 1838, April 10.—N<sup>o</sup> 7612.

REDMUND, DAVID.—“ Certain improvements in the construc-  
“ tion and apparatus of steam boats or vessels used for war or  
“ commercial purposes.”

For the purpose of enabling canal boats to be built of greater  
length than the locks, the centre or body of the boat is to be  
rather shorter than the length of the lock, such part being in itself  
a complete water-tight vessel. “ Two vessels, about ten or twelve  
“ or fourteen feet long,” and of the most approved forms for the  
head and stern of the boat, are then to be connected with the body  
by a joint and strap on each side, on the shaft of which joint a  
toothed wheel is fixed, to enable the ends of the boat to be raised  
when entering a lock, and to be let down and depressed to their  
level on leaving it. To prevent the ends of the boat (when  
upright), in windy weather, pulling the boat on one side, two  
hollow iron rods “ are jointed a short distance from one end,” and

that end goes into a hole in an upright pole in the centre of the boat, while the rods have a small wheel at the other end to run on the banks of the canal on each side of the boat when passing through the lock.

Secondly, in the construction of vessels or boats, where one steam tug boat draws one, two, or more after it, the head and stern of each boat are so constructed that the whole forms "one" continuous boat, so that the resistance to the progress of the "whole is nearly overcome in the first boat."

The third improvement in the construction of vessels consists in improvements on parts of Patent N° 5198. By that arrangement of the bolts which connect the timbers of the vessels, when one timber is annexed to its fellow, the bolts are fixed in it that are to receive the next timber, and project out for that purpose. It is now proposed to use bolts whose length is only equal to the width of the timber, with a male screw at one end and a female screw at the other; or dovetailed plates, and keys.

The fourth improvement consists in so constructing the bottom of the vessel as to allow the extreme under edge of the "propeller" paddles" to be kept within the face of the planking, such channel way to continue from the propeller in a horizontal line until it dies away, or is lost in the upward slopes of the stern, so as to allow a clear waterway from the paddles.

The fifth improvement is in the form of the ribs, and mode of finishing the joints or seams of such vessels or boats as are constructed of iron. The "ribs and cross connections" are to have a fillet worked on their outer surfaces, to lie between the butts and edges of the plates, which are to be bevelled, so that by caulking the edges of the fillet on the bevel edges of the plate, one continuous rivet is formed along all the rivetted joints. The inventor also describes various improvements in the apparatus of steam boats.

(Printed, 1s. 10d. Drawings.)

A.D. 1838, July 11.—N° 7730.

VAN WART, HENRY, and GODDARD, SAMUEL ASPINWALL.

(a communication).—"Certain improvements in machinery or apparatus applicable to locomotion on railroads and to steam navigation, parts of which improvements" are "also applicable to land or stationary engines." "The first improvement consists

“ in a novel or improved day or night signal, to be used on  
 “ railways or locomotive engines, for the purpose of indicating to  
 “ the conducting engineer the position of the shunts or shifting  
 “ parts of the rails, or the direction in which the engines are  
 “ travelling, or whether moving or stationary, which improve-  
 “ ment is also applicable to fence gates, or turn plates, or other  
 “ movable obstructions on railways, and also to steam vessels to  
 “ indicate to others the direction in which she is going.” Of the  
 adaptation of these signals to steamboats, “it will only be  
 “ necessary to say that the spindle” or stem of the lantern is to be  
 “ attached to the engine and connected in any convenient way to  
 “ the apparatus called the reversing ‘ lever ’ or ‘ motion,’ in order  
 “ that the face of the lantern may indicate by its colour ” whether  
 the vessel “is approaching, or receding, or stationary.”

“ Secondly, in a novel construction of lens to be used in the  
 “ said signals, or for other lanterns or purposes connected with  
 “ locomotion on railroads or steam navigation.”

“ Thirdly, in an improved mode or method of connecting or  
 “ coupling the locomotive engines, tenders, and carriages one to  
 “ another.”

“ Fourthly, in an improved arrangement and construction of the  
 “ mechanism, or means whereby the motion of the engine is  
 “ communicated to the running wheels of the locomotive engine.”

“ Fifthly, in an improved arrangement and construction of  
 “ mechanism for working the slide valve of the engine.”

“ Sixthly, in an improved arrangement and construction of  
 “ mechanism for regulating the supply of steam to the engine.”

[Printed, 1s. 8d. Drawings.]

A.D. 1838, September 20.—N° 7814.

DAY, WILLIAM.—“ An improved mode or method of applying  
 “ and combining timber and other materials used in the construc-  
 “ tion of ships or vessels, masts, yards, beams, piers, bridges, and  
 “ various other purposes.”

[No Specification enrolled.]

A.D. 1838, October 22.—N° 7839.

NEWTON, WILLIAM EDWARD.—(*a communication.*)—“ An  
 “ improved method or methods of preparing certain substances

“ for the preservation of wood, and other materials used in the  
 “ construction and fitting-up of houses, ships, and other works,  
 “ which improvements are also applicable to other useful  
 “ purposes.” “ This invention has for its object certain processes  
 “ by means of which natural or other bitumen, or any product  
 “ derivable from the distillation of bituminous schistus coal, and  
 “ such substances, may be put into a permanent liquid state and  
 “ used in that state cold either as a waterproof paint for covering  
 “ fences, wooden palings, or other constructions of wood for the  
 “ purpose of protecting them from the weather or for making a  
 “ composition which may be applied to the construction of roads  
 “ or ways.” The process described is to melt bitumen, and add  
 10 per cent of turpentine and 75 per cent. of rectified mineral oil  
 during the operation. Let this cool, then add 25 per cent. of  
 essence of turpentine, and a mixture of bitumen and hydrate of  
 lime.

[Printed, 3d. No drawings. See London Journal (*Newton's*), vol. 14 (*con-  
 joined series*), p. 164.]

A.D. 1838, November 13. -N<sup>o</sup> 7870.

SMITH, GEORGE.—“ Certain improvements in vessels to be pro-  
 “ pelled by steam or other power, and in the construction and  
 “ arrangement of the machinery for propelling.” The invention  
 consists,—

First, “ in the application of boats to or for the covering of the  
 “ ordinary paddle wheel, and also to the forming the roofs or  
 “ additional coverings over such cabins as are situated on each  
 “ side of the ordinary paddle boxes, which boats are to be pro-  
 “ perly fitted and applied to such situations, so that they shall  
 “ form the roof or covering of the paddle boxes, or an additional  
 “ covering for the cabins, and at the same time be readily made  
 “ available for use as life or other boats in case of danger or other  
 “ occasions.” The boat is to be placed “ over the paddle wheel,  
 “ and secured thereon by proper fittings, or lashed with cords or  
 “ chains, or fastened in any convenient manner, the upper part of  
 “ the stationary or fixed casing being constructed to receive and  
 “ retain the edges of the boat ” And in order that the boat may  
 be launched or lowered into the water with facility, when required,  
 levers are attached to the outer casing of the paddle box by joints,  
 which levers, while the boats form the covering of the paddle

wheels or the cabins, remain in the horizontal position ; but when the boats are required for use in the water, ropes or chains, fitted with proper tackle, are to be attached to the inner ends of the levers, and passed over stanchions or cranes. By these means the boats may be raised up edgewise until their edges are in a perpendicular position, they may then be let fall over the side until they become nearly horizontal, when the levers may be retained by the chains, and the boats lowered into the water by other chains or ropes ; and by the same means they may be hauled up into their position to form the coverings of the paddle boxes or cabins.

Secondly, “ in the peculiar arrangement, construction, and application of certain rotatory paddles or propellers or propelling blades to vessels for the purpose of effecting their locomotion, by which improvements the propellers are rendered capable of being worked, either by steam power or by manual labour of the ship’s crew, should the mechanical agent be out of order, or where thought desirable, the propellers being also so arranged and constructed that they may be removed from out of the water when sails are used to propel the vessel, and also that they shall be under water and out of the range of shots when in action.”

[Printed, 10d. Drawings. See London Journal (*Newton’s*), vol. 15 (*conjoined series*), p. 171.]

A.D. 1839, March 20.—N° 8006.

RUTHVEN, JOHN, and RUTHVEN, MORRIS WEST.—“ Improvements in boilers for generating steam, economizing fuel, propelling vessels by steam or other power, and ventilating vessels, and which may be applied to mines or buildings.” The various improvements are,—

First, “ the improvement in boilers of the spiral pipe and arrangements thereof for placing it in the flue or flues through which the water is pressed from the pump to the boiler.”

“ Second, in condensing the steam by cold air, and passing the heated air to the furnace or where required.”

“ Third, the mode of propelling vessels by steam or other power, from conveying water in, at, or near the bows or otherwise, and discharging it above the surface of the water, thereby rendering paddle wheels unnecessary, and superseding all machinery outside the vessel, and enabling the vessel to be navigated with equal effect in almost every position.”

## SHIP-BUILDING, REPAIRING,

" built, in ventilating vessels by conveying pipes through  
 " them with or without stop cocks, so as air may be admitted or  
 " forced by fanners or otherwise when and where required, and  
 " applying the same in mines or buildings, the power being  
 " applied at the axle of the fanners either by a crank, handle,  
 " pulley, or pinion."

[Printed 1s. 3d. Drawings. See Repertory of Arts, vol. 13 (new series), p. 75; Mechanics' Magazine, vol. 32, p. 122, also vol. 42, p. 29; Practical Mechanics' Journal, vol. 3, pp. 71, 92, 112, and 202, also vol. 4, p. 17; and Inventors' Advocate, vol. 1, p. 122.]

A.D. 1839, April 23.—N° 8044.

**NAPIER, DAVID.**—This invention "consists in constructing iron  
 " steam boats with two water-tight bottoms, of whatever shape or  
 " construction; also in applying the space between the bottoms  
 " for the purpose of condensing the steam from the engines"  
 " without injection water. "In steamers of magnitude" "the  
 " doubling to be continued up the sides."

[Printed, 5d. Drawings. See Repertory of Arts, vol. 13 (new series), p. 218; London Journal (Newton's), vol. 17 (conjoined series), p. 28; and Inventors' Advocate, vol. 1, p. 179. See also Letters Patent No. 11,632.]

A.D. 1839, May 22.—N° 8077.

**OLDMIXON, WILLIAM HENRY.**—This invention consists in  
 building the "top-gallant forecastle and poop decks of vessels  
 " separately from the vessel they may be intended for, and after-  
 " wards in so securing them in their usual place or places on the  
 " vessel, that in case of disaster they may be readily released or  
 " detached, so as to serve as an efficient raft or rafts in preserving  
 " the lives of those on board, but at other times constituting the  
 " usual deck or decks of a vessel." "Should a poop or top-gallant  
 " forecastle deck not be desirable, a false quarter deck, of a con-  
 " struction similar to the poop deck and fastened similarly, can  
 " be fitted over the quarter deck, the companion wheel, skylight,  
 " &c., being built on this upper or safety deck, which in cases of  
 " disaster is to answer the same purposes as proposed in the use  
 " of the poop deck."

[Printed, 3d. No drawings. See Inventors' Advocate, vol. 1, p. 244.]

A.D. 1839, June 12.—N° 8104.

**WATSON, WILLIAM.**—"An improvement in the construction of  
 " ships, and which improvement is also applicable to all sea-going

“ vessels, and also certain improvements in the construction of  
“ boats and other vessels intended to be used on canals and  
“ inland navigation.”

The first improvement “ consists in forming the ribs, or as they  
“ are technically called by shipbuilders ‘ the timbers,’ of iron bars  
“ (or in some cases copper or other metal of sufficient tenacity  
“ may be used) of the sort known in common by the name of  
“ angle or ‘ T-iron,’ bent into shapes suitable for such ribs.  
“ Iron, being stronger and more durable than timber, while at the  
“ same times as it occupies less space, I find it therefore to be a  
“ much fitter material for the ribs of ships than timber as here-  
“ tofore used. The skin or outer casing of the vessel I make of  
“ timber planks as usual, securing these planks to the ribs either  
“ by rivets or screw bolts and nuts ; a strip of patent felt may be  
“ inserted with advantage between the wooden planks and the  
“ iron ribs.”

“ The other of the said improvements consists in constructing  
“ boats and other vessels to be used on canal or inland naviga-  
“ tion, in such manner that they may be temporarily shortened  
“ whenever occasion requires, and be thus enabled to pass  
“ through lock chambers of less length than the boats themselves  
“ are when fully extended. For this purpose I construct them of  
“ two or more separate and independent water-tight parts, and  
“ connect these together by means of hinges or coupling links  
“ and bolts, so that they may be either completely separated and  
“ detached, and placed side by side, or the ends, that is, the stem  
“ and stern parts, turned round or doubled back without being  
“ unhinged or uncoupled.”

[Printed, 5d. Drawings. See London Journal (*Newton's*), vol. 23 (*conjoined series*), pp. 187 and 486 ; and *Inventors' Advocate*, vol. 1, p. 291.]

A.D. 1839, August 5.—N<sup>o</sup> 8186.

FELL, JONATHAN.—This invention “ relates to certain improved  
“ fastenings applicable to the securing the beams to the sides of  
“ ships and vessels.” Its object is “ to employ a mode of fixing  
“ more secure than what is afforded by the simple use of knees,”  
and it may be used conjointly with knees or separately. The  
fastening consists of two bolts, driven horizontally through the  
timbers and planking, one on each side of the beam. Their  
length is about twice the thickness of the side, the inner half of

the bolt passing through a cast-iron tube, which is bolted to the side of the beam and also to the ship's side by means of flanges worked on it.

[Printed, 6d. Drawings. See Repertory of Arts, vol. 13 (*new series*), p. 210; London Journal (*Newton's*), vol. 16 (*conjoined series*), p. 148; and Inventors' Advocate, vol. 2, p. 146.]

A.D. 1839, October 10.—N° 8236.

**HUMPHREYS, JOHN BARNETT.**—"Certain improvements in  
" shipping generally, and in steam vessels in particular."

"The first improvement relates to 'deck fastenings' by a  
" novel mode. Instead of fastening through the deck from the  
" top into the beams, I fasten through the beams or their substi-  
" tutes into the deck." "In cases where great depth of beam or  
" other circumstances make it desirable not to pass the deck fas-  
" tenings up through the beams, I bolt or otherwise fasten a kant  
" timber" "to the side of the beam, and let the deck fastening  
" go through that;" in other cases angle iron is more convenient.

"The next improvement relates to the fastening of the plank  
" sheer in iron vessels. I run an angle iron round the outside of  
" the plate at the sheer line" "The vertical holes in the angle  
" iron I place" about three inches apart, putting holding-down  
screws, nails, or bolts through every other hole for the plank  
sheer, and a nail or other fastening through each remaining hole  
to hold up a wooden fender strake.

"The next improvement relates to the sliding keels introduced  
" into the Royal Navy about one thousand seven hundred and  
" eighty-nine, by Captain Shank," which "I improve" by beardi-  
ing them fore and aft ways under water, and by tapering length-  
wise the thickness of that part of the keel which can be protruded  
below the bottom of the vessel.

"I next improve the sliding keels by making them" and the  
trunk through which they pass "of cast or wrought iron or other  
" metal instead of wood." It is also proposed to make a joint in  
the rudder near the keel, the rudder itself being either of metal or  
wood, so that in shallow water the tail may be lifted by any appro-  
priate means to a horizontal position.

"The next improvement relates to iron or metal vessels" and  
consists, first, in doubling the plates or forming the skin of the  
vessel of several layers of plates, and further in protecting the  
surface of the plate inside, especially where bilge water is apt to reach

When the vessel has much motion, by adding a thin lining, it may be either of wood or metal, and injecting or otherwise applying between the lining and the skin, caoutchouc, tar, resins, paints, putty, &c.

“Lastly, I improve iron or metal vessels by adding vertical longitudinal bulkheads of iron or other metal as high as requisite.” “No keelson will so effectually keep a ship from hogging or the ends from sagging, as one such longitudinal bulkhead;” “in extremely large craft more than one longitudinal bulkhead may be applied with advantage.”

[Printed, 10d. Drawings. See *Inventors' Advocate*, vol. 2, p. 290.]

A.D. 1839, November 23.—N<sup>o</sup> 8279.

HOLMES, WILLIAM DAUBNEY.—“Certain improvements in the construction of iron ships, boats, and other vessels; and also in means for preventing the same foundering; also in the application of the same improvements, or parts thereof, to other vessels.” These improvements consist, “First, as regards iron ships” in the introduction of iron framing, i.e., of vertical ribs, longitudinal stringers, and angle irons, “within the outer skin of the vessel;” in forming “the outer skin or other parts of iron ships in panels, or with rabbetted ribs, plates, or bars of iron, so that in case of injury the injured parts may be easily removed; and in the introduction of iron framework to support the deck planks.”

“Secondly, in forming certain parts of the ship or vessel air and water tight, either by making the hatches and decks so, or by means of air and water tight chambers for the cargo, and the application of an air-pump, or other the like apparatus, and water cocks to fill the same with air or water, in order, under certain circumstances, to make the vessel draw more or less water, by letting in water as ballast, or expelling it by the air-pump, at pleasure.”

“Thirdly, as regards vessels generally, in the application of air-tight bags to various parts of the vessel, ready to be inflated as occasion may require.”

“Fourthly, in the application of cold water pipes to cool a cargo likely to heat, such as corn or other material in bulk or otherwise. And,

“Fifthly, in a flexible connection for canal boats, filling up the

" space between them so as to produce the effect of one long boat  
 " when passing through water, and thereby reduce the amount  
 " of resistance which would otherwise be created."

[Printed, 1s. 5d. Drawings. See *Inventors' Advocate*, vol. 2, p. 339, also vol. 3, p. 10.]

A.D. 1840, February 8.—N° 8377.

TAYLER, JOSEPH NEEDHAM. — The invention consists,  
 " firstly, in the construction and application of a shield, to guard  
 " or protect the paddle wheels of steam boats and vessels from  
 " the shock or action of the sea, when riding or lying at anchor,  
 " or when sailing or scudding under canvass, when the steam  
 " power is not applied; and also to enable such boats and vessels  
 " to veer or tack with greater facility, and in less space and  
 " time." " When riding at anchor the shield may be lowered  
 " before the paddles to guard them against the shock of the sea.  
 " When scudding the shield may be lowered abaft the paddles  
 " for the same object. In veering or tacking, one of the shields  
 " only, that is, the starboard or the larboard shield only, is to be  
 " lowered (as the case may be), thereby rendering the action of  
 " that one paddle wheel over which the shield is so lowered  
 " negative whilst the other is in operation."

" And secondly," in " a means of applying or communicating  
 " the steam power of boats and vessels for the purpose of working  
 " the windlass."

[Printed, 1d. Drawings. See *London Journal (Newton's)*, vol. 21 (*conjoined series*), p. 347, and *Inventors' Advocate* vol. 2, p. 114.]

A.D. 1840, February 8.—N° 8382.

HANCOCK, JAMES — The " invention may be generally de-  
 " scribed as the obtaining a film or stratum of caoutchouc, sup-  
 " ported by wood, whalebone, or other fibrous materials, vegetable  
 " or animal, manufactured or prepared for that purpose, or with  
 " metallic substances manufactured or prepared, or either or all  
 " of them, or as the application of one or more coatings or cover-  
 " ings of caoutchouc, or a compound thereof, upon an intermediate  
 " substance formed of wood, whalebone, or other fibrous mate-  
 " rials, vegetable or animal, manufactured or prepared for that  
 " purpose, or with metallic substances manufactured or prepared,  
 " or either or all of them, according to the uses to which I may  
 " desire to apply them, which fabric or fabrics are then them-  
 " selves applicable to various uses, and may either be used

“ separately for many purposes, or may be combined with or  
 “ covered by well-known materials, so as to be applicable to  
 “ various purposes, of which I may mention, merely by way of  
 “ example, that by this method articles may be produced ap-  
 “ plicable for sheathing for ships’ bottoms,” &c.

[Printed, 4d. No drawings. See London Journal (*Newton's*), vol. 23 (con-  
 joined series), p. 170; and Inventors’ Advocate, vol. 3, p. 99.]

A.D. 1840, February 22.—N° 8391.

KERR, THOMAS.—This invention consists in the composition of  
 a new mortar or cement, applicable to a great variety of purposes,  
 according to the proportion of the several constituents employed  
 in the manufacture. “ Ships’ boats and other sailing craft may  
 “ be coated outside and inside so as to be impervious to water,  
 “ and secure from the ravages of vermin, by means of the follow-  
 “ ing preparations, viz:” for the outside coating a composition  
 consisting of two parts of powdered pipeclay or any other mineral  
 or vegetable substance in a state of dust or powder, one part of  
 powdered chalk or other similar calcareous substance, one part of  
 melted pitch, and one part of common salt. The preparation to  
 be laid on hot, in two or more coats.

[Printed, 5d. No drawings. See London Journal (*Newton's*), vol. 21 (con-  
 joined series), p. 415; and Inventors’ Advocate, vol. 3, p. 131.]

A.D. 1840, May 30.—N° 8523.

ALLISON, JAMES, and LUMSDEN, ROGER.—“ Improvements  
 “ in the manufacture of iron knees for ships and vessels.” This  
 invention consists in rolling wedge-shaped pieces of iron, two of  
 which being united at the butt ends form a common knee; by  
 which means the labour of forging is avoided.

[Printed, 5d. Drawings. See Inventors’ Advocate, vol. 3, p. 372.]

A.D. 1840, September 3.—N° 8614.

HOLMES, WILLIAM DAUBNEY.—The improvements consist,  
 “ First, in the application of iron stringers or ribs fixed obliquely  
 “ to the ordinary angle iron ribs, on the inner side of an iron ship  
 “ or other vessel, to strengthen and give a stiffness to the sides of  
 “ the ship or vessel.”

“ Second, in the application of certain diagonal iron framing to  
 “ the inner sides of iron ships and other vessels, and the connexion

" or union of the same with the stringers, angle iron ribs, and other ribs of an iron ship or other vessel."

" Third, in the application of diagonal iron framing, so as to form beams to be fixed to the bottom of the ship, or between the decks of iron ships or other vessels, which beams are intended to be carried longitudinally or transversely through the ship or other vessel."

" Fourth, in the construction of an iron beam for ships, boats, or other vessels, by a combination of diagonal trussings and iron plates laid together."

" Fifth, in the construction of an iron beam for ships or other vessels, by a combination of iron plates, and wooden boards or planks."

" Sixth, in the application of corrugated plates or bars of iron, for forming stringers, ribs, beams, and other parts of iron ships and other vessels."

" Seventh, in laying plates which form the outside of iron vessels obliquely."

" Eighth, in the application of iron plates, or other metallic plates, for the division of the ship or other vessels into state rooms or cabins, or for the application of iron frames in combination with paper mache, wood, or other material."

" Ninth, the application of layers of several plates one over the other for the resistance of shot, for ships of war and other vessels."

" Tenth, for the construction of an arched or curved beam, for the support of the deck planks or floor of the ship."

" Eleventh, an apparatus connected with the ship or other vessel, to shew the approach of shallow water, or to represent the depth of water in which the vessel floats, and also the application of the same or similar apparatus for representing the profile or section of the ground or bottom of the water over which the vessel passes "

" Twelfth, for the application of the compass suspension for the support of cabins, berths, or parts of the deck of the ship or other vessel "

" Thirteenth, for the means of steering or guiding boats by a rein."

" Fourteenth, for an air-tight elastic enclosure for hatchways, or openings to chambers, boxes, or enclosed divisions of the ship "

[Printed, 1861. Drawings. See *Mechanics' Magazine*, vol. 34, p. 225, and *Inventors' Advocate*, vol. 4, p. 104.]

A.D. 1840, November 2.—N° 8671.

**WIMSHURST, HENRY.**—Improvements in steam vessels, “in communicating power to propellers of steam vessels, and in shipping and unshipping propellers.” The invention “relates,—  
“ First, to constructing steam boats propelled by means of a screw or portions of screws fixed on a revolving axis, when such description of propellers are placed and work in that part of a steam vessel which is usually occupied by the dead wood; and” the “improvement consists in the mode of applying a main body post in one or more pieces, and a lower buttock to obtain strength and convenience of construction to that part of a steam vessel.”

Secondly, “to a mode of communicating power to such propellers,” and,

Thirdly, “to a mode of shipping and unshipping the propellers.”

[Printed, 7d. Drawings. See *Mechanics' Magazine*, vol. 34, p. 382.]

A.D. 1840, November 21.—N° 8711.

**HUTCHINS, WILLIAM HENRY, and BAKEWELL, JOSEPH.**—“Improvements in preventing ships and other vessels from foundering, and also for raising vessels when sunk.” This invention, denominated “Bakewell’s Patent Marine Preserver,” “as respects the prevention of foundering,” consists in the application “of waterproof bags filled with air, to ships or other navigable vessels, secured in” such “recesses and parts of the vessels as will interfere as little as possible with the stowage of cargo, each bag being provided with an induction valve, through which the bag is to be inflated and the return of air prevented, and with a safety valve through which any redundancy of air produced either by super-inflation or by expansion may escape, and thus prevent its elastic force becoming too great for the strength of the bag. And as respects the raising of sunken vessels,” the invention consists “in the application of similar bags in a collapsed state to such parts of a sunken vessel as are sufficiently accessible by means of diving bells or diving hoods, such bags” “being each provided with an induction valve and a safety valve, and having secured to the induction valve, by means of the well-known coupling joint, a waterproof tube

" leading up to an air-inflating apparatus placed in a boat or upon  
 " the shore, when situated near, through which tube air is forced  
 " in to inflate the bag after it is secured to the vessel."

[Printed, 6d. Drawings. See *Mechanics' Magazine*, vol. 34, p. 414; and *Inventors' Advocate*, vol. 4, p. 340.]

A.D. 1841, March 8.—N° 8871.

**DITCHBURN, THOMAS JOSEPH**—" Certain improvements in  
 " ship building, some or all of which are applicable to steam boats  
 " and boats and vessels of all descriptions." These improve-  
 ments consist,—

First, in a mode of " outer and inner planking with wood upon  
 " iron angle bars, whether such bars be angle iron bars or T-iron  
 " bars;" the bars being let into the inner lining or planking so  
 that the outer and inner planking will come together. The outer  
 and inner planking with the iron bars to be secured by screw bolts  
 and nuts.

Secondly, and applicable to smaller vessels, in a " mode of outer  
 " planking with wood upon angle iron bars," and securing by  
 screw bolt fastenings.

[Printed, 3d. Drawings. See *Repertory of Arts*, vol. 17 (*new series*), p. 88;  
*Mechanics' Magazine*, vol. 35, p. 250, and *Inventors' Advocate*, vol. 5,  
 p. 179.]

A.D. 1841, April 29.—N° 8943.

**JEFFERY, ALFRED**. This invention consists in the use of  
 caoutchouc and lac in the manufacture of compositions for coating  
 the sides and bottoms of ships, and for " caulking and paying the  
 " seams of the sides and bottoms."

[Printed 3d. No drawings. See *London Journal (Newton's)*, vol. 21 (*con-  
 joined series*), p. 10, *Mechanics' Magazine*, vol. 35, p. 328, *Inventors'  
 Advocate*, vol. 5, p. 233, and *Engineers' and Architects' Journal*, vol. 5,  
 p. 321.]

A.D. 1841, July 7.—N° 9018.

**MALLET, RONNET**.—" Certain improvements in protecting cast  
 " and wrought iron, and steel, and other metals from corrosion  
 " and oxidation, and in preventing the fouling of iron ships or  
 " ships sheathed with iron, or other ships, or iron buoys, in fresh  
 " or sea water." They consist in the use of the double salts of

zinc or manganese, and ammonia, for cleansing the metal to be coated; then in coating the metal with the alloy of zinc, mercury, and potassium or sodium to prevent corrosion; after this in covering the surface with a protective varnish; and lastly, in covering the whole with some poisonous paint. These several preparations may be used separately; and especially the poisonous paints, as a means of preventing the fouling of copper sheathing when protected by zinc. The inventor also claims the use of the metal palladium, for protecting cast and wrought iron and steel, or any combinations of them.

[Printed, 5d. No drawings. See Repertory of Arts, vol. 1 (*enlarged series*), p. 284.]

A.D. 1841, October 28.—N° 9128.

HOLCROFT, THOMAS.—(*a communication*).—"An improved portable safety boat or pontoon," the framework of which is composed "of a number of separate pieces, capable of being connected or disconnected at pleasure by means of joints, links, hooks, and other like contrivances." The framework may be "of wood, or cane, or metal, or any other strong but light substance," "excepting only that the joint links and rings should in every case be of metal." "When the framework of the boat has been thus put together, it is covered up to the edges of the gunwale with any of the approved sorts of waterproof canvas, or with thin sheets of metal protected from oxidation (as far as may be) by suitable coatings, which covering is to be nailed or otherwise secured to the gunwale. To the stem and stern and sides of the boat floaters "are also attached, consisting of hollow air and water tight cases, either of metal or of some other impervious material, or consisting of cases filled with cork shavings or other substances of the like small specific gravity, or consisting of large pieces of solid cork; and these floaters, when consisting of cases filled in either of the modes aforesaid, are divided into compartments, two, three, four, or more, so that in the event of the compartment being damaged so as to let in air or water, the injury may not extend to the other compartments, and the boat still remain insubmersible. When the boat is not required for use, it can be folded up so as to carry on the shoulder or under the arm, or like an umbrella."

[Printed, 1s. 11d. Drawings. See Mechanics' Magazine, vol. 36, p. 337.]

A.D. 1841, December 16.—N° 9179.

MARY, FRANCIS. "Certain improvements in the construction of ships or other vessels, and the method of propelling them." This invention consists in constructing vessels with a curvilinear or arched deck, called a shield deck, to be faced with iron, formed to an arch of any desirable curve, which facing shall form, with the direction of any missile discharged from cannon afloat, an angle of any desired degree, so that it may glance or throw off the said missile. The shield deck, in connection with the hull or parts of the vessel below it, forms an air or water tight enclosure which may be divided into two or more compartments. "The abutments of the said shield deck are joined and secured entirely round the vessel in any convenient or suitable manner, and at any required distance below the water line, so as to be out of the reach of shot;" and its summit "is in a line with the line of the keel and midship, and is elevated the same distance above the water line as its abutments are below it." "The water wheels of the vessel revolve horizontally under water, the wheels being cylinders or drums," "to which paddles or floats are attached in any convenient manner. The wheels are placed in wheel cases or openings made in the sides of the vessel, and fitting the wheels as near as convenient to avoid contact and friction." The inventor also claims "the method of using the steam engine for the propulsion of vessels, by which the submerged propelling wheel case or apparatus is made to serve as an exhauster or exhausting medium, and the water contained within the wheel case in which it revolves as a condenser, thereby conferring all the advantages of a condensing engine with the lightness and simplicity of the high pressure steam engine, with also the noiseless action of the former."

[Printed, 10*l*. Drawings. See Repertory of Arts, vol. 15 (new series), p. 193, and Mechanics Magazine, vol. 37, p. 43.]

A.D. 1841, December 16.—N° 9185.

NORTON, JOHN.—"The invention relates to a mode of sheathing the bottoms of ships and vessels by electricity in place of the ordinary methods now adopted." "The bottom of the vessel to be sheathed should be previously covered with

“ a varnish or coating of resin or other suitable material.” The vessel is then to be put into a solution of copper or other suitable metal, when, “ by applying the galvanic currents,” the metal will deposit itself upon the sides of the vessel.

[Printed, 3d. No Drawings.]

A.D. 1842, May 24.—N° 9365.

BOYDELL, JAMES, junior.—“ Improvements in the manufacture of keel plates for vessels, iron gates, gate posts, fencing, and gratings.” The invention relates, first, “ to a mode of making the keel plates for vessels by rolling iron into the proper form, in place of forming such keel plates by bending iron plates by hammering.” For this purpose two portions of angle iron are first produced by rolling. They are then combined or clamped together with a flat bottom plate (the edges of which are rabbeted) “ by wood cramps.” “ In this state the iron is put into a proper furnace to be heated to a welding heat, by which the wood cramps will be burnt, but the edges of the iron will run together sufficiently to allow of the combined parts being withdrawn from the furnace and passed between rollers properly formed to roll the iron keel plates into the shape required.”

Secondly, the invention relates “ to a mode of making iron gates, iron fencing, and iron gratings, by welding a series of bars together by rolling.”

And, thirdly, the invention relates “ to a mode of making the feet of posts for gates and for fences, by moulding or forming an enlargement or block of the scoria or fluid cinder of iron works on the end of each iron post, whether for a gate post or for a fence.”

[Printed, 5d. Drawings. See Repertory of Arts, vol. 1 (*enlarged series*), p. 27; London Journal (*Newton's*), vol. 23 (*conjoined series*), p. 105; Mechanics' Magazine, vol. 38, p. 60; and Record of Patent Inventions, vol. 1, p. 316.]

A.D. 1842, June 11.—N° 9388.

HOLDSWORTH, ARTHUR HOWE.—“ Improvements in constructing certain parts of ships and vessels, in order to arrest the progress of fire, and for regulating temperature.” The invention relates to a mode of constructing parts of ships or vessels, such as bulkheads or partitions, floors and ceilings, the external parts of magazines and other chambers or com-

“partments where it is desirable to obtain greater security against  
 “fire, and also where it is desirable to keep any compartment or  
 “part of a ship or vessel” cool; “such mode of construction  
 “providing means for obtaining a flow or circulation of water in  
 “double metal partitions or bulkheads, floors and ceilings,  
 “whereby the water will, in case of fire, carry off the heat, and  
 “prevent the fire extending beyond the bulkhead or other sur-  
 “face within which the water is contained; and in an engine  
 “room or stoke-hole of a steam vessel, by the conducting powers  
 “of the water circulating in the metal bulkheads, or other such  
 “double linings or casings of any part of the engine room or  
 “stoke-hole, the heat of the engine room or stoke-hole will not  
 “only be reduced, but the cabins or other parts of the vessel near  
 “the engine rooms, on the other side adjoining to such bulk-  
 “heads will not be liable to become so heated as at present;  
 “and, further, in the event of fire surrounding a magazine so  
 “constructed, the powder and shells or other matters therein will  
 “be secured from injury”

[Printed, 1s 5d Drawings. See Repertory of Arts, vol. 1 (*enlarged series*),  
 p. 133, Record of Patent Inventions, vol. 1, p. 394, and Practical Me-  
 chanics' Journal, vol. 2, p. 60.]

A.D. 1842, July 7 — N° 9409.

FAIRBAIRN, WILLIAM.—“Certain improvements in the con-  
 “struction of metal ships, boats, and other vessels, and in the  
 “preparation of metal plates to be used therein.” These im-  
 “provements consist in rolling or forging the plates, with which  
 the ship is to be constructed, flat on one side, but with a thick-  
 ening of the edges of the metal on the other side to receive the  
 rivets. “When the metal plates are ready for forming a ship,  
 “boat, or other vessel, the side of one plate is not made to over-  
 “lap the side of another plate so as to bring the rivet holes  
 “over and in a line with each other, as is ordinarily done, but  
 “that edge of the plate” which is thickened “is placed in con-  
 “tact with” the thickened edge “of another plate,” “and in  
 “the same plane with it, so that the rivet holes instead of being  
 “over and in a line with each other, form two rows at some dis-  
 “tance from each other.” These rivets are received by a flat  
 band or bar of iron laying upon the thickened edges. If great  
 strength is required, the bands or bars have a rib worked at right  
 angles to them, so as to form T-iron. When the rivets have been

passed through these bands, bars, or ribs, and through the plates which they overlap, and they are securely driven up, "so firm  
 " a union is thereby formed between the plates as to make the  
 " joints watertight, and in case of any blow or strain upon the  
 " ship, boat, or other vessel, of sufficient force to burst or rend  
 " the metal asunder, such hole or rent will be as difficult to form,  
 " where the thick edges of the plates are united together, as in  
 " any intermediate parts of the plates."

[Printed, 6d. Drawings. See *Mechanics' Magazine*, vol. 38, p. 142; *Record of Patent Inventions*, vol. 1, p. 449; and *Engineers' and Architects' Journal*, vol. 6, pp. 143 and 304.]

A.D. 1842, July 23.—N° 9427.

JOHNSTON, ALEXANDER.—"Certain improvements on car-  
 " riages, which may also be applied to ships, boats, and other pur-  
 " poses where locomotion is required." The "invention consists  
 " in the application of guide wheels or rollers to railway and other  
 " carriages, attached to the sides of each carriage, and placed so  
 " as to act against the side or edge of the rails, in order to prevent  
 " or diminish the friction and consequent loss of the moving  
 " power, stripping or injuring the rails, and other disadvantages  
 " arising from the flanges rubbing on the rails."

On the 17th of January 1843, the inventor disclaimed that part of the title of his invention contained in the words, "which may  
 " also be applied to ships, boats, and other purposes where loco-  
 " motion is required."

[Printed, 4d. No drawings. See *Record of Patent Inventions*, vol. 1, p. 490.]

A.D. 1842, September 3.—N° 9457.

HAZARD, ROBERT.—The improvement proposed to be effected by this invention is to remove the vitiated air within a carriage or cabin, by means of a fanner or ventilator fixed at a convenient place, and put in motion by the revolution of the wheel (or by other motive power) so that "the inmates, however numerous,  
 " may ride any length of time with the windows closed, excluding  
 " damp or dust, and yet enjoy perfect ventilation."

[Printed, 6d. Drawings. See *Repertory of Arts*, vol. 1 (*enlarged series*), p. 296; and *London Journal (Newton's)*, vol. 23 (*conjoined series*), p. 376.]

A.D. 1842, October 8. N° 9487.

DEUTSCHE, CLAUDE EDWARD. (*a communication*).—Improvements in “combining materials to be used for cementing” purposes, and for preventing the passage of fluids, and also for “forming or constructing articles from such compositions of” materials.” Certain preparations are described “particularly” applicable for caulking vessels that trade to those countries “situated between the tropics; also in constructing of steam boats” it may be usefully applied to those parts which are near to the “fireplace and boiler; also for stopping the cracks in the masts, yards, and side of ships.” They are made by distilling bitumen of Trinidad, and adding to it for some purposes, metallic oxide, for others from one to a hundred per cent. of fatty matters, together with wax, resin, sulphur, or caoutchouc. Or, take a quantity of the distilled bitumen, and “add to it a quantity of ether, one or many together vegetable products, such as caoutchouc, the bedellum copal, rosin lac, or elemi of gum rosin, or other rosin, and add thereto a suitable quantity of any essential oil or alcohol, or even oil and alcohol mixed together. The adhesive nature of these preparations will be more or less increased in proportion to the quantity of gum rosin which is put in. The first of these vegetable products, with the addition of a considerable quantity of oil or alcohol, may be usefully employed to render tissues, leather, and wood impermeable. The last of these vegetable products, by the addition of a larger quantity of resinous matter, will make a good cement for cementing stones, metals, and wood used in the construction of vessels.”

[Printed, 4d. No drawings. See Repertory of Arts, vol. 3 (*enlarged series*), p. 200.]

A.D. 1843, April 11. N° 9693.

NAPIER, JAMES. The invention “consists in preparing and” treating fabrics made of fibrous materials, such as hemp, flax, wool, silk, hair, cotton, or other animal or vegetable fibres, woven, twisted, pressed, or otherwise manufactured into cloth, linen, canvass, woollen, silk, calico, cord, thread, rope, paper, pasteboard, felt, or other similar fabric or manufacture, by coating, covering, or incorporating the same with metal or metals, whereby such materials may be rendered applicable to

“ covering roofs, and the bottoms of ships and vessels, and other  
“ surfaces.” This is done by “ depositing metal or metals from a  
“ solution containing the same upon the fabric by means of an  
“ electric current,” derived from a galvanic battery or other  
source.

[Printed, 7d. Drawings. See Repertory of Arts, vol. 2 (*enlarged series*),  
p. 335; London Journal (*Newton's*), vol. 24 (*conjoined series*), p. 429;  
Mechanics' Magazine, vol. 39, p. 430; and Engineers' and Architects'  
Journal, vol. 6, p. 436.]

A.D. 1843, April 20.—N<sup>o</sup> 9702.

BODMER, JOHN GEORGE.—“ Certain improvements in loco-  
“ motive steam engines and carriages to be used upon railways, in  
“ marine engines and vessels, and in the apparatus for propelling  
“ the same; also in stationary engines, and in the apparatus to  
“ be connected therewith for pumping water, raising bodies, and  
“ for blowing or exhausting air.” The improvements in vessels  
are described as follows:—“ The iron plates of which the” pro-  
posed life-boat “ is constructed are placed” “ from the keel (to  
“ which they are fixed at one end) transversely, instead of longi-  
“ tudinally.” They are made with a thickened edge, and vertical  
plates or ribs are worked over the joints, and rivetted on each side  
the thickened parts. As these joint plates answer the purpose of  
ribs, “ and add great strength to the vessel, the ribs may be dis-  
“ pensed with.” The keel is made of cast iron in several lengths,  
jointed or held together by a piece of wrought iron let into  
its upper side, and by another piece on the under side for covering  
the joints; the whole being held together by strong rivets through  
the keel. “ I construct this boat in such a manner, not only for  
“ having it very strong at the bottom, but also for having it as  
“ heavy at the bottom as possible without taking up any extra  
“ room; and with the exception of the opening by which the  
“ machinery and boiler, &c., is put in, and which is afterwards  
“ covered with wood, the deck is made of iron covered with  
“ boards, to be more convenient for standing on, and forms an  
“ oval in its section,” the sides and deck forming one continuous  
oval curve: this construction of boats “ for the purpose mentioned  
“ I consider not only best calculated to resist concussions, but  
“ also to be less liable to be upset.” Strong pieces of timber are  
fixed to the deck, which carry the railing, to the top of which a  
strong wooden frame is secured. The vessel is to be driven by

a steam engine, the propeller being a wheel with wings or vanes working under water and within a case, from one aperture in which the water is expelled, while it enters the case by another aperture.

[Printed, 3s. 6d. Drawings. See *Mechanics' Magazine*, vol. 30, p. 431.]

A.D. 1843, May 30. N° 9749.

NEWTON, WILLIAM EDWARD.—(*a communication*.)—Improvements in the method or system of constructing vessels, to be called the "Mondotian System" of construction—The inventor proposes to construct a "floating drum or cylinder" of about twenty feet in diameter, and twenty-five feet in length, furnished externally with flat boards like an ordinary water wheel, and having within it, in the form of rings, a circular iron railroad, consisting of two rails; and on the lower part of this annular road a locomotive engine, with four or six wheels running as on an ordinary railway. "The movement of this engine, when in motion, is similar to a squirrel's in its cage, thereby making the boat revolve and advance along the surface of the water, the engine itself, however, always remaining in a horizontal position, or nearly so. The locomotive engine is situated beneath the platform," or deck, "which is furnished with chairs, tables, and other conveniences for the passengers." Both the ends of the drum are to be closed, except at the centre, where circular openings, or port holes, about eight feet in diameter, are left for the purpose of admitting air and light into the interior of the drum. "The vessel is steered by means of an oar which projects through one of the port holes." The spaces between the floats are subdivided so as to form a number of open boxes, "thereby confining the air, and making the wheels revolve upon a bed of air. By this means the entire vessel is raised, and the draught of the water diminished, and the speed of the vessel consequently increased." It is proposed to make the paddle wheels of ordinary steamers on the same principle, each vessel to be fitted with four such wheels.

[Printed, 8d. Drawings.]

A.D. 1843, June 15.—N° 9779.

GUPPY, THOMAS RICHARD.—"Certain improvements in the building of metal ships and other vessels." These improve-

ments consist “in the substitution of plates of copper, or other  
“ suitable alloys of metal, instead of plates of iron, for such  
“ exterior parts of the bottoms and sides of ships or vessels as  
“ are exposed to or are liable to be acted on by the water sur-  
“ rounding them.”

“ In the casing over, or what is commonly called sheathing,  
“ the bottoms of iron ships or vessels with copper or other suit-  
“ able alloys of metal,” with regard to which the inventor only  
states, “that instead of nails rivets must be used, and the  
“ sheathing and plates of the bottoms and sides properly drilled  
“ or pierced to receive the same.”

“ In the construction of false internal sides and bottoms to  
“ metal ships or vessels, such false sides and bottoms being  
“ made of sheet iron or other metal, and placed at a suitable  
“ distance from the external bottoms and sides,” “the space  
“ between being divided into compartments or spaces.”

And, “in the application of metal hollow air-tight thwarts and  
“ seats to metal boats.”

[Printed, 8d. Drawings. See Repertory of Arts, vol. 3 (*enlarged series*),  
p. 98.]

A.D. 1843, July 11.—N° 9830.

**LAIRD, JOHN.**—“Improvements in the construction of steam  
“ and other vessels.” The invention relates,—

“ First, to a mode of applying two rudders, one at each end, to  
“ a steam or other vessel, whereby each rudder has an iron guard  
“ to protect it.” Both ends of these vessels are alike, and the  
rudders are formed of a portion of the “deadwood;” they are  
protected by the stem which runs down in front of them.

Secondly, “to a mode of applying rudders in combination with  
“ iron ships or vessels having no keel, nor what is technically  
“ called dead wood or gripe” the object being to facilitate the  
passage of vessels in shallow water, and in waters subject to shift  
ing sands; and also to the making of steamboats of iron, without  
keel, or what is technically called dead wood or gripe.

Thirdly, “to applying an iron water-tight trunk in steam  
“ vessels propelled with screws or submerged propellers, such  
“ trunk being for enclosing the axis.”

And, fourthly, “to a mode of constructing the fore parts or  
“ bows, and the after parts or sterns, of iron ships or vessels for  
“ war purposes;” the object being so to construct the vessel, that

by using a false bow or stern, the "vessel may be sharper forward and aft," and "may carry her forward and after guns with more stability, and be aided by the buoyancy of the false bow or stern."

[Printed, 2s. 4d. Drawings. See *Reportory of Arts*, vol. 3 (*enlarged series*), p. 237, and vol. 19 (*enlarged series*), p. 100.]

A.D. 1843, July 20. — N° 9847.

**BERTRAM, CHARLES.**—(*a communication.*) "An improved mastic or cement."

Take about seventy parts of turf or peat, and having freed the same of the greater portion of the water which it contains, mix it with about thirty parts of tar or pitch. "Leave this mixture at rest for some hours, then put it into a cauldron or other suitable vessel, and keep it boiling for about three hours. The product is a mastic or cement, to which the inventor has given the name of percollane. It is of a very adhesive and tenacious quality, readily soluble after it has become hardened, impervious to water and moisture, and nearly odorous. When it is desired to use this cement for the purpose of coating ships, which are liable to become foul from the adhesion of marine animals and plants," "add to each hundred parts of the peat or turf and tar or pitch about two parts of common yellow soap, and ten parts of oxide of copper, or any other metallic salt of the like poisonous quality."

[Printed, 3d. No drawings. See *London Journal (Newton's)*, vol. 24 (*conjoined series*), p. 42, and *Engineers' and Architects' Journal*, vol. 7, p. 60.]

A.D. 1843, August 14.—N° 9864

**WOOD, JOHN.**—"Certain improvements in machinery or apparatus for affording additional or artificial buoyancy to sea-going and other vessels." This invention consists in the application to floating bodies, of spherical, cylindrical, or other vessels "capable of retaining condensed air," and "made of any flexible material, as india-rubber or caoutchouc cloth, oiled silk, or cloth," protected on the outside by canvass and cordage. By the use of these vessels, the inventor proposes to raise submerged ships, and to lighten the draught of deep ships. He proposes also to attach such vessels, or others made of metal, to the frame of the ship, within the hold, to prevent the loss of buoyancy in the event of a leak. "For the interior of vessels in

“ which the entire capacity of the hold is occupied with cargo,  
 “ the following is a description of the most efficient apparatus;  
 “ namely, a lining or sack equal in capacity to the hold, or made  
 “ in two or more divisions, with mouths corresponding with the  
 “ hatchways. The material of the sack is india-rubber cloth, or  
 “ cloth well oiled, with a canvas or other strong covering or case  
 “ on both sides, loose or forming together one substance with the  
 “ former, and by means of loops or ties on the canvas, united to  
 “ another cover of strong and durable material, as matted cordage,  
 “ with a soft surface next the canvas, and protecting the side of  
 “ the canvas on the skin of the vessel and the side exposed to the  
 “ friction of the cargo. The side next the skin, deck, and beams  
 “ of the vessel, is made fast thereto by ties at suitable points, to  
 “ keep the sack in its place.” These air vessels are also to be  
 used for sustaining bridges, piers, &c.

[Printed, 1s. 5d. Drawings. See London Journal (*Newton's*), vol. 25 (*con-joined series*), p. 267.]

A.D. 1843, September 4.—N<sup>o</sup> 9878.

CATLIN, GEORGE.—“ Certain improvements in the construction  
 “ of vessels for navigation, designed to prevent the loss of life in  
 “ cases of shipwreck or other accidents at sea.”

[No Specification enrolled.]

A.D. 1843, November 21.—N<sup>o</sup> 9958.

HIGGINSON, FRANCIS.—The invention consists in new methods  
 of “ securing, from within and beneath the planking of ships and  
 “ their decks, the external planking generally of ships and  
 “ vessels, together with platforms and floors of all descriptions,  
 “ to the beams or timbers by which they are supported, without  
 “ the application of treenails, bolts, spikes, or nails, generally  
 “ used in the ordinary constructions of ships and navigable  
 “ vessels, or the erections of civil architecture.” The inventor  
 employs straps and brackets of various kinds, fastened by  
 screws working within sockets which are themselves screwed  
 into the timber or other material; and also “ a multi-threaded  
 “ driving screw ” of peculiar construction. The “ general or  
 “ external form ” of the screw is that of a cone, having one  
 or more hollow or sunken threads or concave channels cut

spirally on its surface, from its head or base, to its point or vertex, the lower faces of the threads being "at right angles to the convex surface of the cone," the upper faces forming oblique angles therewith.

[Printed, 1s. Drawings. See *Engineers' and Architects' Journal*, vol. 7, p. 230.]

A.D. 1844, January 25.—N<sup>o</sup> 10,024.

DAVIES, HENRY.—The improvements consist,—“Firstly, in the peculiar construction of that part of a vessel which is immersed in the water, consisting of a channel or way for the flow of a current of water through the hull, under the deck, from head to stern.”

“Secondly, in the adaptation of four pairs of rotary curved plates or paddles within the internal channel or waterway fixed upon two continuous series of shafts, and put in motion by the flow of the current. By this means the pressure of the water toward the hinder part of the channel is made exactly equal to that in the fore part, and the effect of the impeding vacuum at the stern of the vessel becomes annihilated, the power thus obtained being through the shafts transmitted to the two first pairs of screw paddles.”

“Thirdly, in the means of connecting vessels one to another, for the purpose of forming a train or series of passage boats to be worked on canals or rivers.” With this object a trough is to be made of wood or iron, having a flat bottom, and rectangular sides, corresponding, and nearly equal in breadth and depth, to the outside width and height of the boats intended to be connected. A vertical partition is placed in the middle of the trough to keep the two ends of the boats asunder, and to prevent a current of water from passing through it. The ends of the boats being inserted into this trough, the two boats are attached together by a rope or chain, or any other contrivance. “When the train of vessels as they are passing through the water are required to turn at any angle from the straight line, the curved parts of their prow and stern turn in the trough to the required angle.” By these means the resistances at the extremities of the intermediate vessels are avoided.

[Printed, 10s. Drawings. See *London Journal (Newton's)*, vol. 22 (conjoined series), p. 323, and *Engineers and Architects' Journal*, vol. 7, p. 267.]

A.D. 1844, February 14.—N° 10,054.

GALLOWAY, ELIJAH.—The invention consists in the application of certain mixtures of india-rubber, pulverized cork, and corrosive sublimes “to the surface of walls, to flat surfaces of  
“ wood prepared to receive them, or to other surfaces, by which  
“ the said materials will be permanently held in the required  
“ position, or to canvass or other woven material, by which the  
“ whole becomes strong enough to be stretched upon a frame  
“ like the canvass usually employed for pictures, and in such  
“ condition the said surfaces are intended to be used as grounds  
“ for painting.” It is proposed also to use the material “in  
“ ship-building as a substitute for felting, to be placed between  
“ the copper and planking of the ship.” For this purpose it is manufactured in thin sheets of convenient size, which are to be cemented to their respective places by india-rubber cement or other suitable adhesive substance, and then the copper sheets are to be applied and fixed in the usual manner. “By manufacturing  
“ the mixture of cork and india-rubber in the form of blocks,  
“ cubes, or masses of suitable form” it is proposed “to employ  
“ them as planks to fill in the spaces between the timbers or  
“ planking of ships, more particularly in the upper works of such  
“ vessels, cementing such blocks to the wood with which they  
“ are in contact, and to each other, so that the whole becomes  
“ impervious to water; and for the purposes of boat-building, the  
“ same material is to be manufactured into sheets, planks, or  
“ slabs, and used with or without timber courses.”

[Printed, 3d. No drawings. See London Journal (*Newton's*), vol. 25 (*conjoined series*), p. 235; and Engineers' and Architects' Journal, vol. 7, p. 423.]

A.D. 1844, February 17.—N° 10,056.

HOOD, JOHN LIONEL.—(*a communication.*)—“This invention  
“ consists in certain mixtures of copper, zinc, and lead, with or  
“ without the addition of a small proportion of antimony, tin, or  
“ iron, and in which mixture the copper exists in various propor-  
“ tions up to fifty per cent., the object being to produce a com-  
“ pound which is capable of being rolled out into sheets suitable  
“ for the purposes for which copper sheathing has hitherto been  
“ applied, and also for forming ship's bolts, nails, and other  
“ fastenings, the addition of a third or fourth metal to the ordi-

" nary ingredients of brass (which are copper and zinc) being  
 " for the purpose of altering the crystalline arrangement of the  
 " particles of the metallic compound or brass metal (as such mix-  
 " tures are known to metallurgic chemists to do), so as to enable  
 " the manufacturer to roll the same into sheets with a smaller  
 " proportion of copper than has hitherto been practised, by which  
 " means a much cheaper sheathing is produced than sheet copper,  
 " or the sheathing hitherto known as ' Yellow Metal ', and also  
 " to form a compound which is capable of wearing well, yet con-  
 " taining a sufficient proportion of copper to render the surface of  
 " the plates susceptible of oxidation at sea, and thereby poisonous,  
 " by the formation of the cupreous salts, so as to resist the attack  
 " and adhesion of ' barnacles ' and other marine insects, which  
 " would otherwise impede the rate of the ship's sailing."

[Printed, 4d. No drawings. See London Journal (*Newton's*), vol. 25 (*con-joined series*), p. 306.]

A.D. 1844, March 19.—N<sup>o</sup> 10,112.

INGLIS, HUGH.—" Improvements upon locomotive steam en-  
 " gines, whereby a saving of fuel will be effected, which improve-  
 " ments are applicable to steam vessels and other purposes, and  
 " to the increasing the adhesion of the wheels of railway engines,  
 " carriages, and tenders upon the lines of rail when the same are  
 " in a moist state."

[No Specification enrolled.]

A.D. 1844, April 15.—N<sup>o</sup> 10,143.

KENNEDY, JAMES, and VERNON, THOMAS.—" The improve-  
 " ments claimed " in the building or construction of vessels for  
 " navigating on water, built of iron or of wood, or of iron and  
 " wood combined, or of the combination of any other materials,"  
 " are " the introduction of iron rolled solid in one piece, having a  
 " flange on one edge projecting on one or both sides, and a rib on  
 " the other edge projecting on one or both sides, for strengthening  
 " the iron for beams, frames, ribs, or bars " : " of iron rolled in  
 " one piece, having flanges on each edge projecting on one or both  
 " sides, for strengthening the iron and fastening the planks, plates,  
 " or hangings " : and " of iron rolled, with a rib on one edge pro-  
 " jecting on one or both sides for strengthening the iron, in com-  
 " bination with angle or T-iron rivetted or bolted on to the other

“ edge on one or both sides.” Also “ the formation of keelsons, “ with one or more bars of rolled iron, of any of the forms set “ forth and described ” in the specification, “ rivetted or bolted “ together in the form required.”

[Printed, 10/7. Drawings. See Engineers' and Architects' Journal, vol. 7 p. 409.]

A.D. 1844, May 30.—N<sup>o</sup> 10,205.

DEANE, CHARLES ANTHONY.—“ Improvements in constructing, “ propelling, and steering vessels.”

[No Specification enrolled.]

A.D. 1844, July 3.—N<sup>o</sup> 10,243.

BODMER, JOHN GEORGE.—“ Certain improvements in loco- “ motive steam engines and carriages to be used upon railways ; “ in marine engines and vessels, and in the apparatus for pro- “ pelling the same ; and also in stationary engines, and in appa- “ ratus to be connected therewith.” An improvement in uniting plates for building ships or boilers, consists in working a plate behind the joint, to which the edges may be rivetted, and on which there is a rib a little deeper than the thickness of the plates. This rib lies between the edges or butts of the plates, and is caulked to them. The improved rudder, which is double, consists of a cast-iron, wrought-iron, or brass tube, with flanges standing out on each side, to which wooden wings are attached. “ On the top of “ the tube a spun (spur?) wheel is fixed, into which gears ” a pinion, which is in connexion with the spoke wheel, whereby the rudder is worked. Through the tube a wrought-iron turned shaft passes, which is screwed at the bottom into the brass footstep, “ the latter being firmly fixed to the keel of the vessel.” “ In case of the rudders requiring to be unshipped, it is only “ necessary to remove ” an iron strap, to shift back a beam, and to hoist the rudder up through the hole in the counter. “ On re- “ placing the rudder, the shaft ” “ serves as a guide, and the “ operation is therefore comparatively easy.”

[Printed, 4s. 7d. Drawings.]

A.D. 1844, July 3.—N<sup>o</sup> 10,249.

MONZANI, WILLOUGHBY THEOBALD.—“ Improvements in the “ construction of boats for the preservation of life and property,

" and in apparatus applicable thereto," consisting " in a peculiar  
 " method of forming, connecting, and fitting together certain  
 " parts, so as to produce a skeleton boat by the combination of a  
 " bottom or platform with frames and supports (to which flexible  
 " air chambers may be attached), the outer part or hull of the  
 " boat being produced by a casing of canvas or other suitable  
 " material, rendered as nearly waterproof as practicable; which  
 " boat so constructed will be capable of collapsing, for the pur-  
 " pose of stowage, in a comparatively small space, and of being  
 " readily opened out and prepared for use"; and, " in a novel  
 " construction of rudder, the outer part of which is enabled to  
 " rise and fall upon joints or in grooves, in order to prevent the  
 " derangement or fracture of the rudder in the event of its striking  
 " upon a rock, or coming in contact with the ground."

[Printed, 9d. Drawings. See London Journal (*Newton's*), vol. 28 (*conjoined series*), p. 135.]

A.D. 1844, July 24.—N° 10,267.

**COOTE, SARAH.**—This invention consists in " the employment  
 " of wool or hair, saturated with paint or pigment, for caulking  
 " ships or other vessels."

[Printed, 3d. No drawings. See London Journal (*Newton's*), vol. 28 (*conjoined series*), p. 91, and *Engineers' and Architects' Journal*, vol. 8, p. 120.]

A.D. 1844, August 1.—N° 10,283.

**STRATTON, BENJAMIN TUCKER.** " Improvements in welding  
 " sheet iron for ship building and other uses " This invention  
 " consists " in welding plates or sheets of wrought iron, by means  
 " of rollers or other suitable methods, so as to form them into  
 " tubes having longitudinal flanges at their sides, or into sheets  
 " with a series of hollow ribs or channels " For this purpose  
 " I take two, or, in some cases, three plates or sheets of iron, one  
 " or (in some cases) two of which have been corrugated or grooved  
 " by means well understood and commonly employed for that  
 " purpose, and placing one sheet upon the other; I heat them in  
 " a furnace to a good welding heat, I then pass them between  
 " rollers, situated close to the furnace, and of a breadth and form  
 " adapted to run in the grooves or furrows of the corrugated iron,  
 " and by the pressure of the rollers the parts of the sheets of iron  
 " which are in contact become welded together, whilst the inter-

“mediate parts, not being pressed together, form hollow channels  
 “or ribs.” These sheets of hollow metal may be made so light,  
 that “by plugging the ends of the hollow ribs, vessels thus con-  
 “structed would, from their floatability, be nearly equal, in point  
 “of safety, to life boats.”

[Printed, 5d. Drawings.]

A.D. 1844, October 31.—N° 10,372.

BEADON, GEORGE.—“Improvements in life boats or rafts, and  
 “in apparatus for raising or lowering the masts of vessels, which  
 “improvements in raising or lowering are applicable to other pur-  
 “poses.”

The inventor describes a “raft divided in the middle, and open,  
 “so as to float in canal or river boats between its sides for the  
 “purpose of preventing their foundering upon entering more  
 “open waters, and obviating the necessity of discharging their  
 “cargoes into other vessels;” also a life raft “constructed with  
 “hinges or joints, by which means its two sides are closed when  
 “suspended to a vessel, thus occupying little space, but when  
 “lowered in the water it opens and occupies a larger surface.”  
 There is also a “particular improvement in attaching the oar,”  
 “by which its loss is prevented.” He describes further “the  
 “combination of a screw with a toothed wheel or segment thereof  
 “applied to the raising and lowering masts,” in pleasure and  
 other vessels; and the use of a “clip or ferrule with axes or  
 “bearings, secured to the boat’s” thwart, “for lowering a boat’s  
 “mast; and, when lowered, that it” may “be launched forward  
 “through this ferrule without removing the mast therefrom.”

[Printed, 10d. Drawings.]

A.D. 1845, January 23.—N° 10,493.

BORRIE, PETER.—“Improvements in the construction and  
 “fitting or equipping of ships or vessels.” The inventor pro-  
 poses to make in metal ships, a watertight floor or deck, below  
 which there shall be “an uninterrupted communication along the  
 “bottom of the vessel, from the foremost bulkhead to the stern  
 “post.” Above this the ship has a double skin, the ribs between  
 the skins being of Z-iron, strengthened by a system of diagonal  
 trussing. In heavy ships “the outside is covered with plates in

" the usual manner rivetted to the outer flanges of the frames,  
 " and between the frames arched plates" " are fixed, which arched  
 " plates abut upon and are riveted through each frame, and also  
 " to the outside plating, thus forming a series of arches all along  
 " the vessel " The spaces " between the outside plating and the  
 " arches, may be filled with any elastic substance."

The rudder is proposed to be formed of a frame covered with  
 plates, " the plates being turned round at the fore end, so that  
 " with the side of the frame they form a round hole through the  
 " whole depth of the rudder." Notches are cut out in this tubular  
 part to correspond with eyes formed on the stern post, and a round  
 rod is passed down through the whole from the deck, thus forming  
 a strong and secure hinge.

Secondly, there is " an improved method of attaching a sub-  
 " marine propeller to a vessel, so that it can be shipped or un-  
 " shipped with facility when the vessel is afloat."

Thirdly, " improvements in the construction of river and  
 " other steam vessels." The vessel is to be formed with both ends  
 alike, and there is to be " a rudder at each end placed in an  
 " aperture within the vessel." Each rudder has an upright square  
 spindle passing through it, which is placed some small distance  
 on one side of its centre, so that there is a longer portion of the  
 rudder on one side of the axis than on the other.

In the fourth part of the invention the use of iron or other  
 metal tubes for masts and bowsprits is claimed.

And, in the fifth part, " the construction of a vessel with two  
 " hulls connected together by a deck and an arch of iron or other  
 " metal plates, each hull being formed so as to have greater buoy-  
 " ancy on the inner than on the outer side, and the keel and  
 " stems being placed off the centre of the vessel towards the inner  
 " side, so that the angle of the bow may be more acute on that  
 " side than the other."

Drawn to the Drawings. See Artisan, vol. 7, p. 72.]

A D. 1843, March 27 — N° 10,576.

BOWSER, WILLIAM, and BOWSER, WILLIAM, junior.—  
 Improvements in ships' fire hearths, consisting in making provision  
 for a fire on the hearth " either with a range or open fire in front, or  
 with an horizontal hot plate with vertical corrugated surface for  
 cooking purposes."

In the construction of the fire-place and draught for the boilers,  
“ the intensity of the fire ” being “ brought into direct action  
“ on the whole surface of the bottoms of the boilers ; ”

In rounding the angles at the bottom, and sides of the boilers ;

In constructing the “ ovens with hollow bottoms ; ”

In an improved form of “ cap or chimney,” a portion of which  
is formed so that it may be converted into a hot closet ;

In introducing safety boxes beneath the fire-places ;

In an arrangement for increasing the supply of cold air under-  
neath the fire-place ;

And, in the apparatus “ for condensing steam by the action of  
“ the water of the sea.”

[Printed, 1s. 8d. Drawings.]

A.D. 1845, April 2.—N° 10,587.

TUFTS, OTIS.—These improvements consist in constructing  
“ the metallic or iron hull, and the deck or decks, or the hull or  
“ the deck or decks ” of a vessel, of two shells, made of thin sheets  
of iron, riveted or otherwise properly confined together at or near  
their respective edges in contact (both or either of said shells being  
made watertight), and arranging or placing the one of the said  
shells within and at a short distance apart from, and parallel or  
nearly parallel to the other, and connecting and confining both  
together, by means of various mechanical contrivances so as to  
dispense with the framing of ribs. Also in combining a wooden  
deck and iron hull with an iron sheathing or ceiling below the  
deck. And in a mode of protecting the hull of a ship or vessel,  
or of hindering or preventing the passage of shot or other pro-  
jectiles through it, by making the exposed part of said hull of two  
or more cases or casings, and filling the space or spaces between  
the said cases, or between additional internal or external cases,  
with cotton or some other suitable elastic compressible material.

[Printed, 1s. Drawings.]

A.D. 1845, May 24.—N° 10,689.

DETMOLD, JULIUS ADOLPH.—(*a communication.*) — “ Im-  
“ provements in the construction of metallic boats and other  
“ vessels having curved surfaces,” consisting in “ bending sheets  
“ of metal into any required form (which they shall permanently

" retain) without stretching or materially changing the thickness  
 " of the metal, by the employment of peculiarly shaped dies,  
 " suitably mounted and worked by hydraulic or other power. In  
 " making boats according to this invention sheets of metal are  
 " brought into the form of the sides or parts of the sides of a  
 " boat by subjecting them to great pressure between concave and  
 " convex moulds or dies, shaped according to the fashion of the  
 " boat to be constructed. Upon the convex die ribs or raised  
 " surfaces are formed, and in the concave die are depressions  
 " corresponding exactly with the ribs on the convex die, or vice  
 " versa. The width, curvature, and length of these ribs, and  
 " their number and distance apart, will be regulated according to  
 " the surplus metal resulting from the change of a plane or flat  
 " surface (the form of the sheet of metal before being operated  
 " upon) to the curved surface which the metal is caused to  
 " assume in forming the irregular curves in the different parts of  
 " the boat, the object being to take up or form into ribs the  
 " metal which would otherwise wrinkle and buckle up irregularly  
 " during the compressing operation, and at the same time to  
 " afford strength and stiffness wherever it is required in the sides  
 " of the boat."

[Printed, 6d. Drawings. See London Journal (*Newton's*) vol 23 (*conjoined  
 series*), p. 11.]

A.D. 1845, August 22. — N<sup>o</sup> 10,819.

**OXLEY, THOMAS.**—The invention consists, first, in different  
 modes of constructing submarine or screw propellers, " whereby  
 " the area of resistance may be expanded or contracted "

Secondly, in constructing paddle-wheels with self-adjusting  
 floats.

Thirdly, in the " submarine feathering propeller wheel."

And fourthly, in the mode of constructing vessels intended to  
 be moved by submerged propellers, whereby the said propellers  
 may be conveniently shipped and unshipped at pleasure, by the  
 introduction of a " false stern " within which the propellers work,  
 and from which the water is to be expelled, when it is necessary  
 to obtain access to the propellers, by causing the engine to force  
 air into it.

[Printed, 2s. 9d. Drawings. See *Mechanics' Magazine*, vol 44, pp. 161-177,  
 and 467.]

A.D. 1845, October 9.—N° 10,861.

GRAY, THOMAS WOOD.—“Improvements in ports and in apparatus for opening and closing ports of ships or vessels, also applicable in opening and closing windows and other instruments having like movements.” The invention consists, first, in an improvement in the construction of metal ports, by having a groove or recess all round the inner surface of the port, which is filled with cork or other suitable flexible material, retained in position by black varnish or other suitable adhesive material, and by transverse pins.

Secondly, in improvements “in apparatus for opening and closing ports, and also windows, or other instruments similarly hung.” These improvements consist “in having a female screw or nut moving on a male screw, such female screw being, by means of connecting rods or arms, in connection with the port, so that the movement of the female screw or nut along the male screw puts the connecting rods and arms into motion, and thus lifts or closes the port.”

[Printed, 1s. 5d. Drawings.]

A.D. 1845, October 27.—N° 10,898.

ORTON, REGINALD.—“Improvements in life boats, life buoys, and apparatus for conveying persons ashore from wrecked or stranded vessels.” The peculiarities of this life boat consist in her floatation being secured by two buoyant portions on each side of the bottom, and two buoyant ends; in fitting her, if preferred, with a shifting bottom; in her being open at the bottom, so as to allow of a free escape of the water; in the dividing and valvular arrangement employed at each end to secure her righting if upset; and also in the application of the propellers. “The buoyant or floating portions of the boat I make either of metal or wood. These parts I prefer to have divided into numerous compartments, which I make watertight and hollow, or I fill them with some light material, so as to exclude the water.” “At each end of the boat I have arranged a valvular apparatus, consisting of openings stopped with heavy plugs.” “These plugs fall a certain distance if the boat be upset, when the admission of water by the openings into corresponding compart-

"ments causes the opposite side of the boat to float up, and  
 "this disposes it to turn right again. When right the plugs  
 "fall again and close the openings, while the water admitted into  
 "the compartments" is discharged by the scuppers. The pro-  
 pellers "I construct of a frame on which I place three or more  
 "flaps, so hinged that each will open when carried backwards in  
 "the water, and close when carried forwards."

The proposed life buoy is in two portions, being made of hollow metal cylinders twelve or sixteen inches in diameter, united by side pieces of wood. Projecting downwards from the wooden pieces are two deep half-circles of metal plates or of heavy wood, connected below by a cross-piece. "The whole length of the  
 "buoy should be from nine to ten feet." In the central space  
 "I fit a circular box containing a reel and cord," by means of which a constant communication is kept up between the vessel and the buoy. "I also fit a mast to the buoy, hinged at the foot  
 "in such a manner that" "I can cause the mast to rise to the  
 "perpendicular," and in the act of rising to light a port-fire. A sail may be hoisted on this mast, if necessary.

[Printed, as 7d. Drawing, See Repository of Arts, vol 8 (enlarged series), p. 214, and Mechanics' Magazine, vol 44, p. 209.]

A.D. 1845, November 17.—No 10,946.

**BOYDELL, JAMES**—This invention consists in a mode of combining iron and wood in shipbuilding, by which great facility of construction will be obtained, and great strength of structure. The ribs of the vessel are to be made with angle iron, having a flange or double leaf both inside and outside. To the inner surfaces of these ribs the plates of iron are fixed by rivets; then the spaces between the ribs are filled in with wood, the grain of the wood running fore-and-aft, so as to produce a flush surface with the outer surfaces of the iron ribs. The outside of the ship or vessel is then to be planked, and over the planking copper or other sheathing is to be applied. "The planking and other wood-  
 "work are to be made tight at the seams by caulking."

Secondly, in an improved mode of attaching the plates to the ribs of iron ships. "In each rib is formed a groove, and, in place  
 "of rivetting the sheets of iron to the ribs as heretofore, the  
 "sheets" "are bent up at right angles at their ends, and these  
 "bent parts enter the grooves formed in the ribs, and they

“ are wedged tightly therein by wedge-formed bars,” which are fastened by keys driven through. “ By this mode of combining the parts much time will be saved by rendering the rivetting of the sheets to the ribs unnecessary.”

[Printed, 5d. Drawings. See Repertory of Arts, vol. 8 (*enlarged series*), p. 92; London Journal (*Newton's*), vol. 28 (*conjoined series*), p. 406; and Patent Journal, vol. 1, p. 94.]

A.D. 1846, January 20.—N° 11,044.

TAYLOR, PETER.—“ Certain improvements in machinery for propelling vessels, carriages, and machinery, parts of which improvements are applicable to drawing and propelling fluids, also improvements in the construction of vessels.” The invention consists, first, in a mode of arranging propellers “ so that they may form a portion of a cone, and be made of portions of a screw, whether the axles be arranged parallel to each other,” or otherwise.

Secondly, in “ placing the propeller frame on axes so as to adjust at pleasure the depth at which the propeller shall work, and this arrangement of fan is applicable where one or more propeller shafts are used;” in adjusting the trim of the vessel, by moving the boiler or boilers and engines on suitable rails or ways formed in the boat; in applying an “ ice-plough steam-propelled boat ” for inland waters; and in the mode of constructing rotary engines, “ whether such engines be used for the purpose of steam, or for drawing and propelling fluids.”

Thirdly, in connecting a series of boats into a train, so that the after boats may receive or have transferred to them some of the weight of the preceding boats.

Lastly, “ in constructing vessels so as to be especially adapted to passing through heavy seas without the liability of being filled by the waves.” For this purpose the upper part of the vessel is covered in with stout glass, capable of admitting light. Pipes are then fitted, rising considerably above the surface of the vessel, for admitting air into the interior, and removing foul air.

[Printed, 4s. 6d. Drawings.]

A.D. 1846, January 20.—N° 11,053.

SPENCELY, JOHN.—This invention consists, in “ the first place in the application and employment of strengthening stays or

“ braces whereby the parts of the hull of a ship or vessel, or some  
“ of the principal timbers composing the same, are braced or held  
“ together, and the whole fabric rendered more strong and rigid  
“ than if merely constructed in the ordinary manner.” The  
inventor places two long iron braces in the middle of the ship, one  
leading from the after, and the other from the foremost extremity  
of the keelson to the midship beams. They are strongly secured  
at both ends, and set up by a screw in the middle. Where they  
would interfere with masts, &c, a cross head is employed. In  
some cases the midship portion of the ship is trussed by long iron  
braces under the beams, and short braces lead down to the  
keelson in both directions from the extremities of the truss.

The second part of the invention is an “ improved apparatus for  
“ ascertaining and indicating the leeway made by a ship when  
“ sailing with a side wind or lying-to.” It consists of a vane or  
tail jointed to the end of a rod, which is lowered down through a  
hole made in the garboard strake or keel for that purpose. When  
the apparatus is to be used, the fan or tail is lowered into the  
water, which will float the light blades which form the vane, and  
the current of water under the ship will act upon them precisely in  
the same manner as the wind acts upon an ordinary weathercock,  
and will turn the vane or tail round until it is in a perfect line  
with the course of the ship; then by examining a graduated  
indicator above, the observer will at one view be able to ascertain  
the number of points or degrees of leeway the ship makes.

The “ third improvement consists in constructing and working  
“ ships’ pumps in such a manner that they may be made to  
“ pump” “ water from the hold or well of a ship without the  
“ assistance of manual labour and simply by the power of the  
“ wind.” In this case the pump rod is attached to a crank on  
a horizontal shaft. The outer end of this shaft carries a fan,  
consisting of four blades or sails, which, when acted upon by the  
wind, will be made to revolve and work the crank.

The fourth part of the invention, namely, improvements in  
ships’ windlasses, consists in mounting a toothed wheel on the  
barrel of the windlass contiguous to the ordinary ratchet wheel,  
and working the said wheel by means of palls or short levers,  
connected at their opposite ends to a large bent double hand lever.  
By alternately raising and depressing the lever, a continuous  
rotary motion will be communicated to the barrel of the windlass.

The last part of the invention consists of an improved mode of heaving in and out the bowsprit of a vessel, by the application of an iron rack to the upper or under side of the inner end of the bowsprit, and the employment of a strong pinion, which is made to gear into the rack.

[Printed, 10*d.* Drawings. See London Journal (*Newton's*), vol. 30 (*conjoined series*), p. 145.]

A.D. 1846, March 25.—N° 11,150.

DELL, EDWARD CRUMP.—“A new mode of lighting or transmitting artificial light to certain parts of ships, and more particularly to those parts known and distinguished as the powder magazines and shell rooms, or such other parts as may be employed as depositories for ammunition or combustibles.” According to the mode hitherto adopted for lighting such parts of ships, it has been customary to place the light in a distinct and separate room, adjoining the magazine or shell room, and the light thus disposed has required constant attendance. It is proposed to remedy the objections to this mode, first, by dispensing with the necessity for a separate room for the light; secondly, by arranging or disposing of the light in such manner “that it need only be let down from and accessible to the ship’s deck above; and further, that the air required to support combustion of the said light may be supplied from sources totally distinct and separate from the room in which the light is placed,” thereby giving greater security, and a great saving of room. It is proposed to use candles which do not require snuffing, and to keep them raised by a spring.

These improvements are also applicable for the general purposes of lighting buildings, roads, or ways.

[Printed, 9*d.* Drawings.]

A.D. 1846, March 25.—N° 11,151.

TAYLER, JOSEPH NEEDHAM.—“Certain improvements in propelling vessels, and also certain improvements in constructing vessels.” These improvements consist,—

First, in “the substitution for the ordinary vertical paddle wheel on a horizontal shaft,” “of a horizontal or nearly horizontal paddle wheel.”

Secondly, is the "peculiar construction of certain vessels fitted with one or more propellers or other propelling machinery, and the construction therewith of certain machinery or apparatus, by means of which sand, soil, or ballast may be cleared or raised from the bottoms of rivers and of the sea." By the alteration in the form and build of these vessels, consisting in making the stern upright, giving additional support to the beams, &c., great strength is secured at the after part thereof, as well as extra space for the deck. "To the stern of the vessel so constructed is attached the upper end of an inclined frame, on the lower end of which is worked an instrument" for "gathering up the soil and turning it into a bucket, or a series of buckets on an endless chain, which pass up the inclined frame and empty their contents into a barge, large boat, or lighter astern of the vessel, or into a carriage on board the vessel, which carriage passes along a tram or railway formed on the deck, and the soil or ballast is ultimately deposited in the hold."

"Thirdly, I claim the adaptation and application of part or parts of such machinery or apparatus to the carriages, either on railways or common roads."

[Printed, 1s. 8d. Drawings.]

A.D. 1846, April 15.—N° 11,167.

HAYCRAFT, WILLIAM TUTIN — "Improvements in steam engines." Among the improvements described is "a multiplex bearing or journal of a shaft of a steam engine." The shaft is turned into grooves, by which rings are formed. The metallic bearing is composed of two pieces coupled together in the usual manner. "These pieces are turned within into similar grooves, into which the rings of the shaft fit accurately; the whole is secured in a chair in the usual way. The number of the rings may be from one to twenty, or more. The intention is to lessen the friction, when the shaft is moving with great velocity, while there is a great pressure in the line of the axis, as is the case of propellers of steam ships."

[Printed, 8d. Drawings. See Patent Journal, vol. 1, p. 500.]

A.D. 1846, June 2.—N° 11,235.

FOURAN, JOHN WENSTEN. — Certain improvements in machinery for cutting and shaping wood for ship building and

other purposes, consisting, firstly, in the mode of constructing saw-mills or machines with revolving or turning chuck plates, and oscillating or turning intermediate roller supports for the purpose of holding the pieces of timber whilst being cut, such chuck plates and supports being made capable of being turned for the purpose of varying the bevils of the cuts.

Secondly, in the mode of turning and regulating such chuck plates and supports of saw mills, by means of a pair of conical drums.

Thirdly, in the mode of determining the bevils or cuts by means of a graduated semi-circular board and sliding frame.

Fourthly, in the mode of constructing such chuck plates with the jaws or clips thereof mounted upon an eccentric motion, for the convenience of balancing the logs whilst they are being cut.

Fifthly, in the mode of constructing the jaws or clips of such chuck plates, so that one of these jaws or clips may be turned towards either side, for the purpose of better and more securely holding the logs.

Sixthly, in the mode of mounting saws in stretchers, and also the mode of mounting such saws with their stretchers within a saw gate or frame, so as to be capable of sliding laterally.

Seventhly, in the mode of constructing a saw gate or frame with double head or foot rails or bars, or with longitudinal slots and flanges in such head and foot rails or bars; and the mode of mounting saws within such saw gate upon swivels and friction rollers.

Eighthly, in the mode of constructing saw swivels with anti-friction balls or spherical rollers.

Ninthly, in the mode of turning saws mounted upon stretchers or otherwise, by means of feathers or ribs, with the arms or parallel motions connected therewith, and by keys.

Tenthly, in the mode of regulating by means of a pair of conical drums, the motion or speed of the sliding carriage.

Eleventhly, in the mode of balancing the weight of the saw gate or frame by placing a counterbalance weight upon the vibrating beam.

Twelfthly, in the mode of constructing a saw mill or machine with guide rollers and a vibrating roller, for the purpose of feeding.

Lastly, in "the mode of constructing the detached carriages for  
 " the purpose of holding or supporting the ends of logs or pieces  
 " of timber whilst they are being cut, and at the same time allow-  
 " ing them to be moved in any required direction."

[Printed, &c. 11d. Drawings. See *Mechanics' Magazine*, vol. 50, pp. 313 and 344; and *Patent Journal*, vol. 2, p. 746.]

A.D. 1846, July 14.—N° 11,228.

HILL, LAWRENCE, junior. — (*Partly a communication from Henry Barton.*)—"Instead of the method at present in use for  
 " building iron vessels by rivetting plates or sheets of iron in  
 " rows parallel to the gunwale and keel of the vessel, and to one  
 " another, and crossing the ribs or frame of the ship at right  
 " angles," this "invention consists in building or forming the  
 " outside shell or 'plating' of two layers of malleable iron hoops  
 " or bars crossing each other at an angle of about forty-five  
 " degrees with the keel of the vessel." "I do not confine my-  
 " self to any particular breadth or thickness" of hoop or bar,  
 " but a breadth of about three inches will be the most suitable;  
 " it is manufactured or finished with small projections on one or  
 " more of its edges" "the use of which is, to render more  
 " efficient the operation of 'caulking' the seams."

It is proposed that the whole of the hoops, bars, or plates should be punched during the operation of rolling, or otherwise, while they are on the vessel's sides, by machinery so arranged, that while it may be worked by the aid of a steam engine or other motive power, it is also free to be moved to different positions on the sides of the vessel.

It is also proposed to make the keels of large vessels of several thicknesses of iron riveted together.

[Printed, &c. Drawings. See *Repository of Arts*, vol. 9 (*enlarged series*), p. 212; and *Patent Journal*, vol. 2, p. 572.]

A.D. 1846, July 14.—N° 11,295.

BROWN, Sir SAMUEL. — "Improvements in railways and  
 " carriages to run on railways and in the constructing and arm-  
 " ing ships or vessels."

The improvements in ship-building consist in scarphing the members of the frame with side scarphs, supported on each side by thin or copper plates, bolted with iron or copper bolts.

Also in the shape of, "and manner of hanging the rudder, which

“ increases its power of steerage and its security, being less liable  
“ to be displaced or disabled by shot; and it affords the peculiar  
“ advantages of being shipped and unshipped at sea or in harbour  
“ with the greatest ease.” For this purpose a metal rudder pipe  
is securely fixed to the stern post, the mouth of the pipe being  
two feet above the load-water line; the shaft of the rudder is to  
be made of copper or strong amalgamated metal. “ The sectional  
“ area of the rudder shaft for a frigate would be twenty-five  
“ inches.” In consequence of its superior strength it is not  
necessary to connect it with the stern post at all. The head  
of the shaft rests in the upper mouth of the rudder pipe, on a  
metal toggle or fid.

The other improvement consists in “ the employment of two  
“ propellers, one extended beyond the stern post of the ship or  
“ vessel, and revolving in a space cut out of the dead wood or  
“ between the main stern and an additional stern post.” “ The  
“ other propeller, is extended beyond the stern, or a space may  
“ be cut out of the dead wood, and a false or extra stern post  
“ may be brought on, between which and the main stern post  
“ the propellers revolve;” or in “ applying either two propellers  
“ on each side of the stern post, and two on each side of the  
“ stem, or two at either end.”

The inventor also describes a mode of forming “ floating rail-  
ways” in canals, &c.

[Printed, 1s. 4d. Drawings.]

A.D. 1846, July 23.—N<sup>o</sup> 11,303.

CLAUSSEN, PETER.—The invention consists, first, in an  
“ apparatus for propelling ships and boats from the stern.”

Secondly, in “ the method of or apparatus for propelling vessels  
“ and boats, by circularly revolving paddles.”

Thirdly, in the construction of vessels and boats the bilges of  
which may be filled with water or emptied at pleasure, by means  
of air-pumps and other appliances; also in the application of air-  
tight chambers, together with the air-pumps and other appliances,  
to vessels and boats of the ordinary construction; the application  
of boats on the said new plan of construction to the ventilation  
of ships; and the adaptation of the paddle boxes of steamers to  
the ventilation of steamers. “ The bottom ” of these boats “ is of  
“ the form of a double curve, having the keel for its centre, each  
“ half of the curve taking a downward sweep from the side of

" the keel, and then swelling upwards towards the sides," whereby the lowest points of each half curve are brought nearly to, or below the level of the keel, and a bilge is formed on each side of it. At the float line of the boat, the bilges have a flooring laid over them, and the two bilges are kept distinct by means of a partition raised on the keelson, and extending throughout the entire length of the vessel. Both the flooring and the partition are made perfectly air and water-tight. But in each bilge, and at the lowest part thereof, there is a valve, with a screw spindle carried up through the flooring, whereby an opening can be made, either for the expulsion or admission of water from or into the bilge. There is a similar valve in the top flooring of each bilge, by the opening of which valve any water which may surge over into the boat, is allowed to flow off from the floor into the bilge beneath, to be expelled thence through the valve. Each bilge is further provided with an air-pump, by means of which air may be forced into the bilge to any extent required to expel any bilge or other water. Air-tight chambers are placed at the head and stern of the boat, to cause her to right herself, should she turn over. The valves are made to serve the purpose of ventilating the ship, where the boats can be stowed over the paddle wheels, by attaching a ventilating hose to them, to allow the air driven up by the paddles to pass into the ship. Such valves may also be fitted, for purposes of ventilation, in the covers over the wheels where this peculiar kind of boat is not adopted.

Fourthly, in " improved methods of applying motive power to the  
 " propelling of boats and barges, and other like craft, on canals,  
 " rivers, roadsteads, harbours, &c., as also to the propelling of  
 " carriages and other vehicles on roads, railways, tramways, &c.,  
 " and generally to all propelling purposes."

[Printed, 2s. 7d. Drawings. See Patent Journal, vol. 2, p. 638; and Engineers' and Architects' Journal, vol. 10, p. 88.]

A.D. 1846, August 15.—N° 11,335.

BUCHANAN, JOHN.—" Certain improvements in ships or  
 " vessels, and in the propelling thereof, and in securing the same  
 " from frontal damage, certain parts of which machinery may  
 " be used for motion on land." The invention relates, first, to  
 " improvements in ships or vessels," and consists in so drawing  
 the lines of the ship or vessel, that they will all run correctly into  
 each other, and so " adjustment by shifting transverse sections

‘ will be called for.’ “ In lieu of water lines, ribband lines, and  
 ‘ buttock lines, with their necessary accompanying balance and  
 ‘ adjusting frames, I only make use of the midship section, an  
 ‘ upper extreme height of breadth line, and one main diagonal on  
 ‘ each side of the hull, uniting or filling in all the transverse  
 ‘ sections from the upper height of breadth to the main diagonal,  
 ‘ and thence down to the keel, in the same manner as is followed  
 “ in constructing the main frame, videlicet, bisecting or halving  
 “ the angles contained within the several perpendiculars (or  
 “ straight lines approaching more or less to the perpendicular),  
 “ and also all the angles within the straight lines crossing these  
 “ perpendiculars, and the diagonals at the points where the trans-  
 “ verse sections respectively cross the main diagonals; lines traced  
 “ through these bisections of the angles form the outside of the  
 “ frame of the ship.”

And, secondly, “ I claim the application of a blade or blades for  
 “ the propelling of ships or vessels so constructed as to yield to  
 “ the adverse pressure of the water when required.”

On the 15th February 1847, the inventor disclaimed the part of  
 the title after the words “in the propelling thereof,” and on the  
 19th February 1851, he disclaimed “such part of the said inven-  
 “ tion as consists of improvements in ships and vessels,” because  
 it was not of such great utility as to enable him to bring it into  
 successful operation and effect, during the continuance of the  
 term granted by the Letters Patent.

[Printed, 1s. 3d. Drawings. See Repertory of Arts, vol. 9 (*enlarged series*),  
 p. 261; Patent Journal, vol. 2, p. 704; and Engineers’ and Architects’  
 Journal, vol. 10, p. 178.]

A.D. 1846, August 17.—N<sup>o</sup> 11,341.

ROBERTSON, JOSEPH CLINTON.—(*A communication.*)—“ An  
 “ improved method of constructing boats, ships, and vessels of  
 “ wood.”

“ A number of skeleton frames similar to the ribs of a boat are  
 “ first made from a draft or model, and accurately formed upon  
 “ their outer edges to coincide with the lines of sections taken at  
 “ various parts throughout the whole length of the intended  
 “ boat;” the outline of the whole series together forming an  
 “ exact model or counterpart to the inside of the boat (with the  
 “ bottom upwards) to be constructed thereon;” this model or  
 “ form when once constructed will answer for any number of boats.

The whole of the frames have a groove or notch for the reception of the keelson. Where it is practicable the piece of timber used for the keelson should be long enough to form of one piece the "apron" or "stemson," and the "rise" at the stern, or "sternson." The keelson being bent into its place upon the moulding frames, the upper or gunwale strake may be fitted. For a boat of twenty feet in length, by five feet in width, this strake ought to be made of oak plank, about two inches broad by one inch in thickness. "The planking forming the shell of the boat is put on in strips of about one inch and three-quarters in breadth, and supposing straight grained pine or cedar timber is used it should be of about one inch in thickness." The first strip is attached to the gunwale either by nails or screws, which are made to enter at the one edge, and after passing through the strip in the direction of its breadth, to enter the gunwale strake in the same direction. "The two ends of the strips are nailed or screwed to the stemson and sternson, the ends of those on the one side of the boat being half lapped over or into those on the other side of the boat. Each successive strip of planking as it is put in its place is secured to the succeeding one in the same way as just described." "When the garboard strakes are put on, the boat, after being smoothed off with a plane, will have assumed its exterior form without any nails or screws being visible excepting those at the stemson, sternson, and garboard strake." For forming the keel, the stem, and the sternpost, a strip or rod of wood, in one continuous length if possible, is used, it may be about two inches thick and three inches and a half in width; the ends are made with a double bevel upon that side intended to go next to the boat, with the inclinations of the bevilled parts tending towards the centre of the piece of wood, so that they may house-in and fit close upon the ends of the strips." It will not be either necessary or proper to caulk boats or other vessels constructed according to the present improved method." To render boats more permanently buoyant, and to enable them to throw out any water they may ship over the gunwale, two airtight chambers are formed under the flooring of the boat, separated in a longitudinal direction by the keelson. The capacity of the chambers is such that the load water-line of the boat is below the flooring. Two openings pass through the flooring and the bottom of the boat, and are open to the water below, and the boat

above, but have no communication with the chambers; any water which may happen to come into the boat runs immediately through these openings, on account of the level of the flooring being higher than that of the surface of the water outside. The water is prevented from entering the boat through the openings in the flooring by valves, which open only in a downward direction. Two air-tight compartments, one in each end of the boat, will, from their elevated position, cause the boat to right upon the water in the event of her being upset.

[Printed, 9d. Drawings. See London Journal (*Newton's*), vol. 34 (*conjoined series*), p. 89; and Patent Journal, vol. 2, p. 651.]

A.D. 1846, August 29.—N° 11,356.

HOLDSWORTH, ARTHUR HOWE.—The invention consists in  
“ the application of india-rubber (caoutchouc) which has been so  
“ chemically treated as to retain its elasticity and pliability under  
“ varying temperatures of extreme heat and cold,” to the construction of boats and buoys, “such descriptions of india-rubber  
“ when used for such purposes being made into tubes, vessels,  
“ or hollow apparatus capable of retaining air therein.” In respect to giving buoyancy to boats, “I prefer the apparatus to  
“ be of the tubular form, and I attach such apparatus by cords or  
“ nittles to the raisings under the thwarts, from the head to the  
“ stern of the boat;” “or I place such tubes across the boat  
“ under the thwarts, to which I attach them with cords or nittles.  
“ I cause apertures of about five inches long and three inches  
“ wide to be made in the sides of a boat, the bottoms of such  
“ apertures to be even with the thwarts of an ordinary boat.”  
“ Each such aperture I provide with a shutter, which I prefer to  
“ be a valve or door, so hung that it will open outwards, and  
“ that when closed water cannot flow into the boat through it.”  
If the boat should fill with water, the tendency of the tubes to raise the boat at once causes the water to flow out through the apertures until the gunwale of the boat be raised “as high above  
“ the surface of the sea as is the difference or height between  
“ the apertures and the gunwale, when the crew would easily  
“ throw out the rest of the water.” The vessels have a mouth-piece or apparatus suitable for allowing them to be filled with air; and they may be enclosed in network or canvass. For these

purposes india-rubber of about one-eighth of an inch in thickness is used.

[Printed, 8d. Drawings. See Repertory of Arts vol. 9 (*enlarged series*), p. 215, London Journal (*Newton's*), vol. 30 (*conjoined series*), p. 160, Patent Journal, vol. 2, p. 672, and Engineers' and Architects' Journal, vol. 10, p. 143.]

A.D. 1846, October 15.—N° 11,410.

MUNTZ, GEORGE FREDERICK.—The manufacture of sheathing metal, "by so using other suitable metal or metals when copper and zinc are combined for the purpose of sheathing, as to allow the mixture to contain a less proportion of copper than about sixty of copper and forty of zinc, and at the same time obtain a sufficient degree of oxydation and prevent separate action on the zinc." "An alloy of copper and zinc with another metal," according to this invention, "suitable for sheathing, which I have found to possess the same properties of oxydation as my former metal," Letters Patent, N° 6,325, "and yet with an important reduction of the quantity of the copper employed, and by which the cost of producing sheathing metal is materially reduced," consists of fifty-six parts of copper, forty and three quarter parts of zinc, and three and one quarter parts of lead.

[Printed, 3d. No Drawings. See Repertory of Arts, vol. 9 (*enlarged series*), p. 335, London Journal (*Newton's*), vol. 30 (*conjoined series*), p. 268; Mechanic's Magazine, vol. 40, p. 782, Patent Journal, vol. 2, p. 792, and Engineers' and Architects' Journal, vol. 10, p. 160.]

A.D. 1846, November 3.—N° 11,434.

WETTERSTEINT, BARON CHARLES. "Improvements in the manufacture of sheet metal for sheathing and other purposes, in preventing the corrosion of metal, and in preserving wood and other materials." These improvements consist, first, in a mode of manufacturing sheet metal, by combining with one hundred parts of lead, one or two parts of regulus of antimony. "By thus compounding the lead with antimony I am enabled to obtain sheets superior to lead alone, and suitable for the same purposes, particularly for water tanks or cisterns, as the lead will be less chemically acted on."

Secondly, in manufacturing copper into sheets, "I add a quantity of regulus of antimony in the proportion of one pound to about two hundred pounds of copper, at the same time I add

“ about two or three pounds of calcined soda.” In combining copper and other metals to be afterwards rolled into sheets for sheathing and for other purposes, “ I have a mould of cast or wrought iron coated with clay and sand, and heat the same to a red heat, and when in that state I pour into it one part of copper to about four or five parts of yellow metal,” or brass. The same process may be employed with lead and tin, the proportion being four or five parts of lead, and one of tin.

In preparing a paint to be applied to the surfaces of metal and wood, mix one part of regulus of antimony with from two to three parts of copper; when melted it is run out into water, and afterwards dried; add to this about two parts of oxyde of copper, and grind the whole together; then make a solution, composed of tar and naphtha in equal parts, and mix it with the metallic composition. “ When preparing paints in which zinc or lead is employed, I use antimony in the proportion of one and a half parts of antimony to one part of zinc or lead, and when tin is used the proportion is from two of antimony to one of tin.”

To make another composition for preserving wood or other surfaces, “ take thirty pounds of tar, thirty pounds of pitch, twenty pounds of dried soot, and four pounds of tallow of sperm oil, and melt the whole together, adding naphtha.”

For the prevention of the corrosion of copper or zinc, take about sixty pounds of muriatic acid of commerce, about ten parts of oxyde of copper or old copper, and about three pounds of regulus of antimony; mix, and place the sheets or nails therein; allow them to remain for two or three days, the solution being kept at a temperature not less than seventy degrees Fahrenheit.

[Printed, 4*l*. No drawings. See Repertory of Arts, vol. 9 (*enlarged series*), p. 357; London Journal (*Newton's*), vol. 30 (*conjoined series*), p. 415; Patent Journal, vol. 2, p. 862; and Engineers' and Architects' Journal, vol. 10, p. 225.]

A.D. 1846, November 19.—N<sup>o</sup> 11,455.

BROCKEDON, WILLIAM, and HANCOCK, THOMAS.—“ Improvements in the manufacture of articles where india-rubber or gutta-percha is used.” To “ manufacture caoutchouc, gutta-percha, or a compound thereof, with or without gritty or coloring matters and fibrous substances, and form them into sheets of any required thickness” for “ sheathing,” &c.

[Printed, 3*d*. No drawings. See Repertory of Arts, vol. 10 (*enlarged series*), p. 103; and Mechanics' Magazine, vol. 43, p. 504.]

A.D. 1847, April 6.—N<sup>o</sup> 11,648.

STRATTON, BENJAMIN TUCKER.—“Improvements in railways  
“and in wheels and other parts of carriages for railways and  
“common roads, partly applicable in the construction of ships or  
“other vessels, and improvements in machinery for manufacturing  
“certain parts of the same.”

“First, the constructing of wheels for common road carriages  
“with spokes of corrugated or hollow iron.”

“Second, the constructing of wheels for railway and common  
“road carriages with spokes formed as sectoral loops of corru-  
“gated or hollow iron.”

Thirdly, a new mode of “casting the naves of railway and  
“common road carriages”

“My improvements in carriages for railways and common roads  
“consist in forming the ribs or standards of corrugated iron.”

“This part of my invention is also applicable to the construction  
“of iron ships or vessels, by forming the ribs of such vessels of  
“corrugated iron, and rivetting or bolting thereto the transverse  
“plates or sheathing.”

Also, certain apparatus “for the purpose of forming the spokes  
“of my improved wheels”

[Printed, 7d. Drawings. See London Journal (*Newton's*), vol. 31 (*con-  
joined series*), p. 344.]

A.D. 1847, April 8.—N<sup>o</sup> 11,652.

NAPIER, DAVID —“Improvements in steam engines and steam  
“vessels.” The improvement in steam vessels consists in “a  
“mode of constructing a vessel's bottom in combination with  
“condensing apparatus and other parts, whereby a more advan-  
“tageous result will be obtained in condensing steam, and at  
“the same time the parts of the condensing apparatus will be  
“rendered more accessible than heretofore. In order to carry  
“out this part of my invention I so construct the bottom of a  
“steamboat that it shall form the bottom of the chamber in  
“which a system of tubes are arranged for condensing the steam,  
“and I apply additional engines, which are at all times to work,  
“for pumping the condensed water into a proper cistern, from  
“which, by ordinary force pumps, the water is to be forced to the  
“boiler or boilers, and for giving motion to a fan for causing

“ water to circulate through the condensing apparatus when the  
“ steam boat is at rest.”

[Printed, 1s. 1d. Drawings. See Repertory of Arts, vol. 10 (*enlarged series*),  
p. 326; and Patent Journal, vol. 3, p. 498. See also Patent, No. 8044.]

A.D. 1847, May 4.—N° 11,684.

GREENHOW, CONRAD HAVERKAM.—The inventor states that “in draughting a vessel, great advantage will arise from  
“ making the necessary displacement as near to the surface of the  
“ water as practicable, on account of the increase of resistance to  
“ her movements in the deeper water.” “I prefer,” he says, “the  
“ greatest breadth” of a ship “at top to be one-third the length  
“ of keel, and to be placed in such a position that the bow at that  
“ level will describe an exact semicircle;” “this will place the  
“ broadest section at one-sixth from the fore end.” The height  
from the bottom to the gunwale amidships to be not more than two-  
thirds of the greatest breadth. From the broadest section let the  
narrowing towards the stern be in such a ratio as to make the top  
breadth at the stern post equal to one side of the square, of  
which the greatest breadth is the diameter. Then take the  
depth from bottom to gunwale amidships as a radius, and “from  
“ the centre of top breadth at broadest section, describe the  
“ segment of a circle; to form the bottom, take the same radius,  
“ and from the extremity of the breadth on each side at same  
“ section, intersect the segment of the circle described from the  
“ centre, there let the floor terminate. From this point, with the  
“ same radius, draw the segment of a circle to meet the extremity  
“ of the top breadth, and the outline of the section is complete;  
“ the same process will give the section at any part.” “A vessel  
“ draughted in this manner will, by the great displacement in her  
“ bottom, float much nearer the surface than any of like capacity  
“ which are now built,” and also on account of her narrowing  
towards the after end, commencing so far forward, “she will steer  
“ with ease and facility; at the same time, all her sections being  
“ segments of the same circle, her motions on the water, when  
“ exposed to a heavy sea, will be easy and without strain.” The  
ship is to have bilge keels.

The inventor also describes a mode of propelling vessels.

[Printed, 1s. Drawings. See Repertory of Arts, vol. 10 (*enlarged series*),  
p. 321.]

A.D. 1847, May 4.—N° 11,687.

STOW, GARDNER.—“Improvements in the construction of steam vessels, and in apparatus for propelling ships and other vessels.”

[No Specification enrolled.]

A.D. 1847, July 3.—N° 11,777.

MITCHELL, ALEXANDER.—“A dock of improved construction, to facilitate the repairing, building, or retaining of ships and other floating vessels; and that certain parts employed in the construction of the said dock of his invention are also applicable to other purposes.”

This is an extension, for the term of fourteen years, of N° 6446.

A.D. 1847, July 3.—N° 11,782.

RAY, JOHN.—The invention consists of a mode of fitting the interior parts of ships, warehouses, and other depôts, for the purpose of facilitating the delivery of the cargoes or contents thereof. For this purpose the interior parts of a ship, vessel, warehouse, or depôt are constructed with covered passages or roadways, along which trams, waggon, or other carriages may pass and repass, so that when goods are shipped or stored in bulk in such ship, vessel, warehouse, or depôt, they may be transferred into the trams or waggon. If the invention be applied to a ship, vertical shafts are constructed, communicating with such covered passage or passages, and rising up to proper hatches or openings in the deck of the vessel, so that when portions of the cargo of the vessel are from time to time conveyed along the covered passage or passages to the foot of such shaft, they may be raised up and taken out of the vessel.

[Printed, 10*l*. Drawings. See London Journal (*Newton's*), vol. 32 (*conjoined series*), p. 24.]

A.D. 1848, January 7.—N° 12,027.

GILMORE, JOHN.—A “mode of ventilating the interior of ships and other vessels by means of two or more tubes or pipes, composed of zinc or other metal, or other materials, passing

“ through the hatchways or the deck of such vessels, provided  
 “ with movable and adjustable hoods, and producing inward and  
 “ outward currents of air.” The mouth or opening of the hood  
 of one of the ventilating tubes is directed towards the wind, so  
 that the wind in meeting the hood shall cause a current of air to  
 descend the ventilating tube; and the “ hood of the other ven-  
 “ tilating tube is placed so that the mouth or opening of the hood  
 “ will be directed from the wind, so that the wind will draw a  
 “ continued current of air through the ventilating tube from the  
 “ interior of the vessel.”

[Printed, 9d. Drawings. See London Journal (*Newton's*), vol. 32 (*con-  
 joined series*), p. 248; and Patent Journal, vol. 4, p. 451.]

A.D. 1848, February 8.—N<sup>o</sup> 12,057.

ZERMAN, JEAN NAPOLEON.—Improvements in ships and other  
 navigable vessels, consisting in constructing such vessels “ with-  
 “ out any keel of the ordinary description, and also with an open  
 “ longitudinal space or tunnel at the bottom or under side, and  
 “ along the whole length of the vessel;” the objects in view  
 being “ to cause such vessels to draw less water, to stand more  
 “ steadily and without ballast, and to prevent them from being  
 “ drifted from their courses.” This open space or tunnel should  
 be of such a height, that the top or ceiling of it shall not be under  
 water when the vessel is fully laden.

[Printed, 9d. Drawings. See Repertory of Arts, vol. 12 (*enlarged series*),  
 p. 360; London Journal (*Newton's*), vol. 33 (*conjoined series*), p. 265;  
 Artizan, vol. 7, p. 14; and Patent Journal, vol. 6, p. 3.]

A.D. 1848, April 12.—N<sup>o</sup> 12,121.

MEACOCK, JAMES.—“ Improvements in preventing and extin-  
 “ guishing fire in vessels, warehouses, and other buildings, parts  
 “ of which improvements are applicable to ventilation.” As  
 vessels carrying coals on long voyages, are very liable to be burned  
 by spontaneous combustion of the coals, it is proposed to apply  
 “ hollow or tubular apparatus in the midst of the coal in such  
 “ manner as to conduct off the gas as the same passes off from  
 “ the coal.”

Secondly, a means of preventing and extinguishing fire in ware-  
 houses and other buildings and vessels is to be employed, con-  
 sisting in laying on, by suitable pipes and apparatus, a supply

of water to each floor, room, or apartment, in such manner that in the event of fire commencing on any floor, water may quickly be thrown in numerous jets by one or more rose-heads, or other distributing apparatus, to a sufficient extent to prevent the fire spreading, and to extinguish that which has already taken place.

Thirdly, perforated sheet metal is to be employed for the cornices of apartments and cabins, for the purpose of ventilation, " which perforated metal I cause to be bent or stamped into forms " suitable for cornices, by which the cornices will be hollow; and " I make passages or openings from such hollow cornices into " the chimney of the apartment, or into the open air, or both, " using slide or other valves to close or regulate the passage of air " through such openings."

On the 29th of October, 1852, a disclaimer of all these improvements except that for preventing spontaneous combustion of coals, was filed by Robert Tronson, and Fairlie Russell.

[Printed, in Drawings. See Repertory of Arts, vol. 12 (*enlarged series*), p. 304; Artisan, vol. 7, p. 57; and Patent Journal, vol. 6, p. 33.]

A.D. 1848, April 27.—N° 12,139.

HOWE, JAMES K. The discovery and improvement is " the " producing of figures or forms for the hulls of vessels of all sizes, " according to the arcs or curves of two unequal circles in con- " tinuation, or of ellipsis for the dead rise fore and aft," " in " combination with curves or arcs of a circle or circles for the ribs " and sides, made up throughout of similar curves, and set upon " or along the curve of dead rise fore and aft," " with the planes " of the ribs pointing or converging towards the centers of the " circles of which the curves for dead rise fore and aft are re- " spectively formed, or when the ellipse is used with their planes " perpendicular to tangents of the line of dead rise." It follows from this system that " the hulls of vessels produced according to " it present no straight lines or surfaces whatever to the water, but " everywhere, horizontally and vertically, are curves." Another effect is, that " the sides being throughout their length upon the " same curve, or rather equal curves, when the curve of the central " rib is obtained all the others may be cut or sawed to correspond." " Also, further, a vessel built in this manner, owing to the shape " of the ribs and the manner of setting them upon the keel, their

“ planes pointing to centres will be of greater strength and power  
“ to resist the action of heavy seas, and will present also an easy  
“ surface, so that their force will be much less felt and the waves  
“ more easily turned aside.”

[Printed, 11*d.* Drawings. See Repertory of Arts, vol. 12 (*enlarged series*), p. 327; Artizan, vol. 7, p. 82; and Patent Journal, vol. 6, p. 52.]

A.D. 1848, July 18.--N<sup>o</sup> 12,215.

PURNELL, CHARLES.—“ An improved apparatus to be applied  
“ to timber-loaded and other vessels laden with materials the  
“ specific gravity of which is lighter than water, preventing the  
“ necessity of abandoning them at sea by ridding them of the super-  
“ incumbent water, and enabling them thereby to carry sail,” which  
consists in placing two or more tanks or cisterns on each side of  
the interior of the vessel, containing from fifty to a hundred gallons  
each. “ In the interior of these tanks or cisterns, and near to the  
“ bottom of the same, is placed a self-acting valve opening to any  
“ pressure from within, and closing against any pressure without;  
“ and from each of the said valves a pipe leads to an aperture in  
“ the side of the vessel.” “ By the use of this apparatus in the  
“ event of the vessel leaking, the rolling or motion of the vessel  
“ will keep the water below a certain level, for as the vessel rolls  
“ to starboard, the cisterns or tanks upon that side will be filled  
“ with the water in the interior of the vessel, and as the vessel  
“ rolls over to larboard, as soon as the pipes leading from the  
“ valves of the starboard tanks rise above the level of the water  
“ on the outside of the vessel, the pressure of the water against  
“ the outside of the valves being removed, the water in the said  
“ tanks will, by its own gravity, open the valves and flow off by  
“ means of the pipes leading through the side of the vessel, the  
“ larboard tanks at the same time filling, and so on alternately as  
“ long as the level of the water in the interior of the vessel is  
“ higher than the lowest point to which the motion or rolling of  
“ the vessel will cause the tanks to dip; thus, in the event of the  
“ vessel leaking, the water in the interior of the vessel is pre-  
“ vented from rising above a certain level by the motion of the  
“ vessel itself.”

[Printed, 9*d.* Drawings. See Mechanics' Magazine, vol. 50, p. 90; Artizan, vol. 7, p. 133; and Patent Journal, vol. 6, p. 154.]

A.D. 1848, August 7.—N° 12,230.

**NEWTON, DAVID.**—"The first part of my improvements in the  
 " application of glass or glazed surfaces to nautical, architectural,  
 " and other similar purposes, consists in the application " " of  
 " glass terminals of a globular or other form to the mast-heads,"  
 yard-arms, &c., " of vessels, in order to protect the same from the  
 " action of the electric fluid, more especially in tropical climes,  
 " the glass terminal acting as a non-conductor or lightning  
 " repellant, and also as a telescopic object of sight on the horizon."  
 The inventor also describes the application of glass in vanes, finials,  
 and other architectural decorations; and in pianoforte keys, let-  
 ters, numerals, &c.

[Printed, 9d. Drawings. See London Journal (*Newton's*), vol. 34 (*con-  
 joined series*), p. 246, *Mechanics' Magazine*, vol. 50, p. 140, *Artisan*,  
 vol. 7, p. 184, and *Patent Journal*, vol. 8, p. 206.]

A.D. 1848, September 15 — N° 12,269.

**SAGER, WILLIAM.**—The invention consists, first, in a novel  
 and peculiar method of generating steam.

Secondly, in several novel methods of propelling, drawing, and  
 steering carriages on land.

Thirdly, in methods of propelling boats or vessels upon canals  
 and other shallow waters, by means of rods wrought by a steam  
 engine or engines, and acting or pressing against the bottom or  
 bed of the canal or river.

Fourthly, in a peculiar form, shape, or model of boats, ships,  
 and other vessels. The hold of the vessel "is made narrow and  
 " deep, and is tapered off to a sharp extremity at the bow, so as  
 " to oppose a much smaller body to the resistance of the water  
 " than is presented by vessels of the ordinary sectional form;"  
 and the deck part or hull of the vessel is moulded or formed so as  
 to converge inwards from about the water line downwards, "and  
 " to sit almost flat upon the surface of the water." The depth of  
 the ship is thus made to be nearly twice the breadth. "This nar-  
 " rowing of the hold is for the purpose of enabling the ship to  
 " pass through the water with increased speed."

Lastly, in "the application or employment of an ordinary  
 " ship's sail or sails supported in the air by means of suitable  
 " balloons, and used for the purpose of transporting ships and

“ other vessels, and thereby conjointly effecting the transit and  
“ conveyance of goods, passengers, and correspondence.”

[Printed, 3s. 2d. Drawings. See *Mechanics' Magazine*, vol. 50, p. 261;  
*Artizan*, vol. 7, p. 207; and *Patent Journal*, vol. 6, p. 234.]

A.D. 1848, November 29.—N° 12,344.

LANE, JOHN, and TAYLOR, JOHN.—The invention relates,—

“ First, to novel arrangements of that class of engines com-  
“ monly called rotary engines, which engines are also applicable  
“ as pumps for the purpose of raising and forcing water and other  
“ fluids, and amongst other uses are applicable to extinguishing  
“ fires.” The cylinder should have teeth formed upon its peri-  
phery when it is to be used for pumping water or other fluids,  
or for the purpose of extinguishing fire, that motion may be  
communicated to it by any suitable power, the openings into  
and from the engine being made suitable for the passage of  
water or other fluids, and a suitable air vessel being attached to  
the outlet passage when such is desired.

Secondly, to novel arrangements of parts of railway carriages.

Thirdly, to a novel construction of boats, whereby the stowage  
of such boats may be the more readily effected, and to forming  
the ribs of boats of metal slightly elastic, so as not to be injured  
by striking against another body. The metal ribs are connected  
at their lower ends to the keel plates, and at their upper ends to  
transverse plates. The seats are capable of being removed, so  
that in stowing, several such boats may be placed one within the  
other. The framing is to be covered with strong india-rubber or  
other suitable waterproof cloth. Cork or other buoyant material  
is to be affixed to the ends of arms which are capable of sliding in  
recesses formed under the seats. The object of this is to add to  
the buoyancy of the boat, and when the parts are drawn out from  
the sides of the boat to prevent the boat from capsizing.

Fourthly, to a novel arrangement of the rudders of boats. The  
rudder is suspended with part of its surface in front, and part  
behind its points of suspension, “ by which arrangement the water  
“ will always act equally on the whole width of the rudder,  
“ whereby considerably less strain upon the parts will be pro-  
“ duced, and greater facility will be obtained in steering a vessel  
“ with a rudder so hung.” When it is desirable to have such  
rudders applied to vessels moved by screw propellers, the rudder

is hung before the propeller, in an aperture like that ordinarily cut for the screw. It is made of metal, in two parts, one above and the other below the screw shaft, the axis of the rudder stepping into the keel, and having an elongated ring shape at the height of the shaft, so that the shaft may work through it.

"Fifthly, our invention relates to improvements in brewing."

[Printed, ss. 2d. Drawings. See *Mechanics' Magazine*, vol. 50, p. 528; and *Patent Journal*, vol. 7, p. 107.]

A.D. 1849, January 11. — N° 12,414.

**BLAKE, OBER.**—"Certain improvements in ventilating, or ventilators for or in ships, vehicles, houses, or other buildings." The ventilator to be applied to ships, steam boats, or other navigable vessels consists of horizontal strips of thick glass, arranged in a rectangular frame or sash, and all lying in the same plane. The edges of these strips are bevelled, and lay closely together. Each piece is pivoted at both ends in a system of levers, by means of which the strips may be separated from each other to any desired extent. The telescope ventilator is a hollow cylinder, in the outer end of which a glass is fixed. This cylinder can be pushed out through a hole in the side of the ship, and is capable of admitting air, or of allowing it to escape through perforations in its sides.

[Printed, 1s. 1d. Drawings. See *Mechanics' Magazine*, vol. 51, p. 42.]

A.D. 1849, February 6. — N° 12,452

**BROWNE, JOHN.**—"Improvements in constructing and rigging vessels, and improvements in atmospheric and other railways." The inventor describes a "wheel-rigged ship," the characteristic of which is, that by means of a wheel or wheels, the whole of the sails may be made to work round at once. "There may be one line of six masts, more or less, or two lines of six masts, with their sails, more or less; there may be likewise one or more lines of masts above to answer as top sails or top-gallant sails; they may be constructed and worked in the same manner by the wheel. There may be one or more keels or one broad one doing the duty of two. In having two rows of masts the projector relies upon the pressure of the windward sails, to counteract the pressure on the leeward sails. "The pressure on the windward side of the keel would act as a counterbalance to the

“ pressure of the leeward side of the keel, and tend to steady the  
 “ ship. I should propose for the wheel-rigged ship to be built in  
 “ shape either as the hulls of ships are at present, or to have the  
 “ hulls of the wheel-rigged ship, as well as other ships, a broad  
 “ head with a sharp snout, and from the head to the stern to  
 “ diminish gradually, by which I suppose a more general ten-  
 “ dency would arise to be impelled forward.”

The inventor also describes improvements in “ the atmospheric  
 “ railway ;” and what he calls a “ balloon railway.”

[Printed, 3*d*. No drawings. See London Journal (*Newton's*), vol. 35 (*con-  
 joined series*), p. 111; Mechanics' Magazine, vol. 51, p. 142; and Patent  
 Journal, vol. 7, p. 193.]

A.D. 1849, May 31.—N<sup>o</sup> 12,625.

DUGDALE, JOHN, and BIRCH, EDWARD.—“ Certain improve-  
 “ ments in constructing and propelling ships or other vessels.”

The invention consists “ first, in so constructing ships and  
 “ other vessels that a channel or channels of peculiar forms for  
 “ containing the screw propeller or propellers is or are left in the  
 “ lower part of their ” hulls.

“ Secondly, in placing two or more screw propellers of the same  
 “ pitch, and of different diameters, on the same shaft.”

[Printed, 9*d*. Drawings. See Mechanics' Magazine, vol. 51, p. 545; and  
 Patent Journal, vol. 8, p. 115.]

A.D. 1849, June 5.—N<sup>o</sup> 12,638.

MILLER, DANIEL.—“ Certain improvements in the mode of  
 “ drawing ships up an inclined plane out of water.” “ The fixed  
 “ incline plane, and the carriage which is to travel thereon, and  
 “ the means of receiving and bearing or supporting the ship upon  
 “ such carriage, are to be as usual ” in what is called Morton's  
 slip; “ but in place of the usual motive force of capstan or  
 “ winches to be worked by men with wheel and pinion work for  
 “ encreasing the force and winding up a chain for drawing the  
 “ carriage with a ship thereon up the inclined plane out of water,  
 “ a hydrostatic cylinder and ram or piston actuated by steam or  
 “ other power,” “ is to be applied by way of a motive force for  
 “ the said purpose.”

[Printed, 1*s*. 2*d*. Drawings. See Mechanics' Magazine, vol. 51, p. 547;  
 Practical Mechanics' Journal, vol. 2, p. 239; Artizan, vol. 8, p. 45, also  
 vol. 10, pp. 45 and 253; and Patent Journal, vol. 8, p. 149.]

A.D. 1849, June 7.—N° 12,643.

**PAYNE, EDWARD JOHN.**—“The invention relates, firstly, to  
 “ a mode of constructing a boat or buoyant vessel,” “and also  
 “ to the use of certain materials of which such boat or vessel  
 “ is constructed.” The boat is to be about thirty-five feet in  
 length, ten feet in breadth, and three feet in depth. It is flat  
 bottomed, and the sides curve inwards until they nearly meet.  
 The keel, which is of iron or other metal, runs along the middle of  
 the flat bottom, and receives the ribs which are at first horizontal,  
 and then curve round the sides, terminating in rowlocks, and  
 leaving a space of about two feet between them. In this interval  
 the rowers sit on small pieces of board fixed on pillars stepping  
 into the keel. The boat is made in air-tight compartments, which  
 are to be formed of sheets or plates of gutta-percha, or of gutta-  
 percha combined with india-rubber.

Secondly to a method of moulding gutta-percha and its com-  
 pounds, and to the construction of the apparatus required for  
 the purpose.

“Thirdly, to the manufacturing of liquids to be employed as  
 “ waterproofing paints or varnishes by compounding gutta-percha,  
 “ india-rubber, gummy copal, gummy damar, resin, shellac, tar,  
 “ pitch, linseed oil, sugar of lead, white of lead, litharge, alum,  
 “ and spirits of turpentine.”

[Printed, 1s 2d Drawings. See *Mechanics' Magazine*, vol. 51, p. 671, and  
*Patent Journal*, vol. 5, p. 129.]

A.D. 1849, June 26.—N° 12,673.

**GRAY, THOMAS WOOD.**—“Improvements in waterclosets, pumps,  
 “ cocks, lubricators, and deck lights.”

The “semi-spherical pump” described by the inventor, consists  
 of a cylindrical induction chamber, communicating by means of two  
 valves with a semi-spherical chamber of greater diameter than the  
 cylinder upon which it rests, and with its convex side downwards.  
 This chamber is bisected by a vertical partition, and has a hori-  
 zontal cover in which are two valves opening into an upper educa-  
 tion chamber. At a little distance below the cover of the semi-  
 spherical chamber, and at the height of the centre of the sphere, a  
 horizontal axis supports two semi-circular plates inclined to each  
 other, and fitting against the surface of the chamber; each of these  
 plates or flaps contains a valve opening upward. Motion is com-  
 municated to them by fitting a crank on the axis, the arm of which

works in the slot of a long lever pivotted on a horizontal axis, at the back of the pump.

The "horizontal flapper pump" is worked by a lever and crank in a similar manner, but the hemispherical chamber is dispensed with, and the flaps form the top of a pair of bellows with vulcanized india-rubber sides, by means of which the water is drawn from two induction chambers, and then forced into two eduction chambers, one on each side of the bellows.

The improvements in "deck-lights" consist in placing the glass in a circular metal frame having projections corresponding to openings in a rim let in the deck, so that the frame, being inserted into the rim, may, by being turned slightly round, be supported on the projecting portions of the rim. A female screw is cut in the latter, and a male screw on the former, fitting into each other. This frame may be removed, and an air grate substituted, having "metal holes instead of glass." The inventor also describes improvements in water-closets, valve-cocks, and lubricators.

[Printed, 2s. Drawings. See *Mechanics' Magazine*, vol. 51, p. 619; *Artizan*, vol. 8, p. 56; and *Patent Journal*, vol. 8, p. 174.]

A.D. 1849, June 27.—N° 12,678.

FORSTER, JOHN THOMAS.—"Improvements in building ships, boats, and other vessels; and also in the manufacture of boxes, packing cases, roofs, and other structures requiring to be water-proof." The "invention consists of applying boards or planks, coated with gutta percha or with gutta percha combined with other matters, as planking and as sheathing, and also as linings or ceilings of ships and boats and other like descriptions of vessels."

N.B. On the 27th of December, 1849, a disclaimer was filed, of all that part of the title contained in the words "and also in the manufacture of boxes, packing cases, roofs, and other structures requiring to be waterproof."

[Printed, 4d. No drawings. See *Mechanics' Magazine*, vol. 52, p. 19; and *Patent Journal*, vol. 8, p. 178.]

A.D. 1849, July 4.—N° 12,684.

GRANTHAM, JOHN.—"Improvements in sheathing ships and vessels." The invention "consists of so applying copper or  
No. 19.

" other metal sheathing to iron ships, that such copper or other  
 " sheathing shall be affixed to an interposed sheathing or coating  
 " of material, not a conductor of electricity, between the iron  
 " vessel and such metal sheathing." It is proposed, in building  
 iron ships or vessels, to work as portions of the frame, vertical  
 ribs or straps outside the plates, and so as to cover the vertical  
 joints of the plates; and to use horizontal angle iron or other  
 bars on the inside; but when sheathing iron ships or vessels  
 already built, suitable ribs or projections are to be added on the  
 outside of the ship or vessel. The ribs have bevelled edges, the  
 broader part being outside, so that there will be dovetailed  
 grooves formed between them, into which wood is forced in  
 horizontal strips, to receive the fastenings of the wood sheathing,  
 which is then worked over all, and is capable of receiving the  
 ordinary metal sheathing. The outside ribs or projections are  
 not to be employed where wool, gutta percha, or compounds  
 thereof, or other non-conducting sheathing or coating may be  
 " fixed by cementing or melting, or in such manner that the  
 " metal fastenings for fixing the copper or other metal sheathing  
 " will not pass through or come in metallic communication with  
 " the iron of which the ship or vessel is constructed."

The invention also "consists of an arrangement of apparatus  
 " for employing hot blast to heat the bottoms of ships when  
 " sheathing the same or preparing therefor."

[Printed, 9d. Drawings. See Repertory of Arts, vol. 15 (*enlarged series*),  
 p. 140, London Journal (*Newton's*), vol. 57 (*conjoined series*), p. 94;  
 Mechanics' Magazine, vol. 52, p. 36, Artisan, vol. 6, p. 56, and Patent  
 Journal, vol. 8, p. 193.]

A.D. 1849, August 1.—N<sup>o</sup> 12,726.

YULE, ANAN, and CHANTER, JOHN.—"Improvements in the  
 " preparation of materials for coating ships and other vessels."  
 The invention consists "in preparing and manufacturing com-  
 " positions or paints for preserving and protecting ships or other  
 " vessels from marine deposits on yellow metal, copper, and  
 " single-bottomed wood ships or iron."

First, take from eight to ten parts of bullock's gall, to which  
 " add about thirty lbs. of carbonate of iron or plumbeo in a fine  
 " powder; mix together to form a paste;" to which add sea  
 water.

Second mode, mix “thirty lbs. of carbonate of iron or plumbago, finely powdered,” about three lbs. of white arsenic, two and a half gallons of coal tar naphtha, or spirit of turpentine, and twelve to fourteen lbs. of Stockholm pitch, dissolved in the above spirit.

“Third mode, for iron or zinc we use as a first coating a preparation of gutta percha or india-rubber, together or separately, dissolved in coal tar naphtha, or other solvent.”

Fourth mode, take ten lbs. “of carbonate of iron or plumbago, finely powdered, and one lb. of white arsenic mixed intimately, and add, with the assistance of heat, as much Russian or other tallow as will serve to incorporate them thoroughly. This is to be applied when hot.”

[Printed, 3d. No drawings. See Repertory of Arts, vol. 17 (*enlarged series*), p. 169; London Journal (*Newton's*), vol. 36 (*conjoined series*), p. 386; Mechanics' Magazine, vol. 52, p. 113; and Patent Journal, vol. 8, p. 224.]

A.D. 1849, August 1.—N<sup>o</sup> 12,730.

MURDOCH, JAMES.—(*A communication.*)—The invention consists, firstly, in “the employment of a current of air produced by an exhausting fan, combined with a condenser,” for the purpose of accelerating evaporation in the conversion of sea water into fresh by distillation, and in the distillation of alcoholic and other spirituous liquids.

Secondly, in “the employment of a current of air, produced by an exhausting fan, in the concentration and crystallization of syrups and saline solutions.”

Thirdly, in “the employment, for the evaporation of liquids, of an evaporating vessel, composed of a series of metallic compartments, forming a continuous zigzag channel,” “whether such vessel be closed and connected or not with an exhausting fan for the process of distillation, or whether it be employed simply as an open evaporating vessel.”

Lastly, in “ventilating of ships by means of descending and ascending currents of air, produced by means of an exhausting fan, and the combining such method of ventilation with the process” of converting sea water into fresh.

[Printed, 10d. Drawings. See Mechanics' Magazine, vol. 52, p. 115; and Patent Journal, vol. 8, p. 259.]

A.D. 1849, October 12.—N° 12,803.

CHRISTOPHERS, JOHN.—“Improvements in naval architecture.” These improvements consist in “steering ships and other vessels by a pair of rudders placed in the fore body of the vessel, or at some distance on the foreside of the foremost stern post, one twin rudder being placed in the port or larboard half of the vessel, and the other twin rudder in the starboard half of the vessel.”

In the combination of ventilating pipes with diluting pipes, both of which pass down the openings between the timbers, and extend from the weather deck to the hold, the latter to allow rain and sea water to pass down and dilute the bilge water, and the former to carry off foul gas.

“In constructing and fastening the frames of vessels.” Each frame is to consist of one row of timber only, and the “room and space” is to be reduced. “Upon each head of every floor timber, and upon every head and heel of every other timber, I fix a flat iron band tightly over it, so as to prevent its being split by driving bolts or treenails into near the heel or head of such timber.” “Upon the head of the stem, as well as the stern post, an iron band should be fixed.”

Longitudinal iron stringers are to be applied abreast of the beams on each deck. The clamps are to be worked in two thicknesses, the inner one running behind the beams and receiving the plates. These iron stringers are introduced for the purpose of preventing any beam from pressing upon merely one timber; and of preventing a vessel from breaking her sheer. Iron riders are also introduced, “which are flat bars of iron placed upon the ceiling over the middle line of every wood frame, and are extended from near the keelson to such part of the top timber as will enable the upper part of the rider to be bolted with two bolts through substantial parts of the top timber and the outside planking.”

In a “substitute for a lodging knee, which I call a kneeson.” In a vessel of 200 tons burden, this kneeson, in its flat part, may be about two and a half feet long, three inches wide, and one inch thick. In its bolt part it must be sufficiently long to extend from the “hold side surface” of the iron stringers to the outside of the outside planking, where it is to be clenched upon a metal ring, or square plate. The diameter of the bolt part is one inch.

In "making the outside planking of a vessel from the gunwale to the keel in two thicknesses of plank instead of only one thickness," for the purpose of shifting the butts so as to add to the strength when the pressure is vertical; of covering the butts when the pressure is lateral, so as to prevent any butt from starting outwards; of faying both thicknesses closer to the timbers than if there were only one thickness; and of creating a stop for the caulking of the outside plank. Both thicknesses are "fastened to the wood frame with my clip bolts or clip treenails."

"In making the ceiling of a vessel in two thicknesses of plank, instead of only one thickness, and in fastening such ceiling with my "clip bolts."

"In making the upper deck of a vessel in two thicknesses of plank instead of only one thickness, and in fastening such deck with my "clip bolts."

In equipping ships and other vessels with two new sails, one of which, "called by me a courson, is a substitute for the square sail or course now bent to or hoisted up to lower yards; and the other sail, which I call a triangle, is a substitute for the trapizium-shaped sails now used on ship-board." "In order to prevent the lower mastheads of vessels from being carried away so often as they are now, some of the after of each gang of shrouds may lead to the cap part of the masthead, instead of all the shrouds leading to the trussel-trees' part of the masthead."

"In making the yard of a ship or vessel out of two small spars instead of one large spar, which I do by uniting the two small spars together at their butts or largest ends by a hollow wrought iron cylinder, and a wood dowell fixed to the large ends of the two spars."

In setting up ships' and vessels' shrouds "by live-eyes, with grooved or scored rollers."

In "fixing by molten lead or other soft metal a brass or other metal tube into the centre of the wood or iron sheaves of ships' blocks."

In "fastening block pins into ships' blocks by molten lead or other soft metal."

In "an improved treenail for fastening the outside and inside planks to the timbers of ships and other vessels, and which I call a clip treenail." "In addition to an enlarged head, it has towards its end a shoulder all round the wood, which shoulder

is formed by tapering the treenail for a short distance between the point and the head. When the treenail is driven into a plank and timber, the shoulder prevents the treenail from starting away from the timber; and as the enlarged head prevents the plank from starting away from the timber, the plank becomes firmly clipped to the frame."

In "an improved metal bolt" of a similar shape, for fastening the deck plank, the ceiling, and the outside planks, "which I call a clip bolt."

"In better securing the bolts of the shackles of chain cables, which better security I afford by using lead for the pins of the shackles instead of wood or iron."

"In placing the hawseholes of vessels nearly close to the stem; therefore the holes may have to be cut out of the knight heads, and instead of the hawse pipes being round externally, they should be square externally, so as to get a firmer bedding upon the wood without so much tendency to split the wood upon which they bear. Hawseholes so placed will enable the vessel to ride at anchor more head to wind, and prevent her shearing about."

"In strengthening the under part and sides of the keel, the upper part and sides of the keelson, and the under part and fore side of the fore foot of a vessel, and protecting them from chafing and twisting and breaking," by bolting to them bars of flat iron, similar to those for the beam stringers.

"In introducing iron pillars into the ship's hold between the centre lines of the keelson and the beams." "The iron pillars are formed out of thick round bar iron, and a conical shoulder is made near each end of every pillar. Two oblong square pieces of cast iron, each with a semicircular conical hole, and which when placed together shall form a conical hole just sufficient to receive the end of the pillar, are then made to clasp the shoulder" when these are fastened, "the pillars can neither move up nor down."

"In making the pump well of an iron hollow cylinder with a flange at the heel."

"In making the lower masts of large ships in two or more lengths of wood, inserting the small end of one length into a deep square socket of another length, and then placing a long wrought-iron cylinder over the joint."

“ In forming the lower mast out of four spars pyramidically placed in the vessel ; their bases rest in the hold on cross-steps which extend several feet across the keelson, and the pyramid tapers gradually to the mast-head where the four spars meet and are braced together by the trussel-trees and cap. By this plan the masts and rigging might be secured without throwing any pressure upon the sides of a ship.”

“ In substituting for a ship’s futtock shrouds, wood or iron stays, which extend from the ends of the lower cross trees to the upper part of the lower mast-head.”

In “ a new mode of fastening chain topsail sheets to the topsails.”

- “ In securing a rim of metal to a wood sheave of a ship’s block.” “ The advantage of a metal rim is that it admits of a deeper score to receive the rope.”

And, “ in making a temporary rudder, which is composed of two fins, out of some short pieces of planks placed over each other crosswise, and bolted or nailed together. As the fins of a temporary rudder will be attached to the sides of the vessel, one fin on each side, and as, therefore, they will be nearer the surface of the water, their size must be larger than if the fins were near the keel. In one side of each fin, there are holes to reeve large rope or small chain, which is to serve the purpose of hinges and to keep the fins in a vertical position in the water, and they are then fastened to part of a bower cable, which is put overboard and brought round the vessel’s bottom abreast of the foremast, and then bowsed taut. A rope guy from the outer end of each fin leads aft where the guy is fixed to prevent the fins traversing forward beyond an angle of about ninety degrees from the vessel’s side, and there is a rope leading forward from the outer end of each fin to a block at the end of” a topsail “ yard, temporarily fixed on the deck a short distance abaft the stem, which latter rope leads inboard to a tackle or tiller, and thus the vessel is steered.”

[Printed, 2s. 1d. Drawings. See Repertory of Arts, vol. 20 (*enlarged series*), pp. 247 and 269; Mechanics’ Magazine, vol. 52, p. 318; and Patent Journal, vol. 9, p. 142.]

A.D. 1849, October 12.—N<sup>o</sup> 12,810.

BONELL, CORNELIUS.—“ Certain improvements in rotary engines, and in the construction of carriages, vessels, and other

" vehicles, and for the machinery to be connected therewith."  
 " With regard to the manner of using my improvements in the  
 " construction of carriages, vessels, and other vehicles, and the  
 " machinery in connection therewith, I cause one or more flexible  
 " rails, chains, ropes, or warps to be laid down and made fast at  
 " each end." The vessel or vehicle "is then brought over the  
 " said flexible rail or warp, the sliding shaft is drawn back, the  
 " rail or warp is drawn up over the said shaft, which is then pushed  
 " back into its place, and the rail or warp is introduced between  
 " the driving wheels, which are brought in contact and kept  
 " down by spiral or other springs over the shafts at their bear-  
 " ings; motive power is then applied to the same, and the boat  
 " or vehicle moves forward, whether on a rail or other road, or on  
 " water."

[Printed, 7d. Drawings. See *Mechanics' Magazine*, vol. 32, p. 316, and  
*Patent Journal*, vol. 9, p. 20.]

A.D. 1849, November 2.—N° 12,824.

**JORDAN, JOHN.**—The improvements consist, first, in the combination of an iron frame, the ribs being of any suitable shape, with an external covering of timber planking for the sides, bilges, and bottoms, fastened in any suitable manner.

Secondly, in making "the butt ends of the timber planking  
 " with an iron plate placed inside to cover the vertical joints, the  
 " iron plate being of sufficient length and thickness to be fastened  
 " to the ends of the abutting planks; and between the timber  
 " planking and the iron plate I place a thickness or layer of felt,  
 " gutta percha, or india rubber. In this manner I add strength  
 " to the planking, and at the same time make a water-tight joint."

Thirdly, in making "an iron plate of any suitable form run the  
 " whole length of the bottom of the vessel, to which I fasten a  
 " keel made of timber, with bolts or rivets, or any other suitable  
 " fastening."

Fourthly and fifthly, "I cause the iron plate forming the keel  
 " plate to be continued up the bow of the vessel," and also up the  
 stern, to which plate a stem and a stern post made of timber are  
 fastened, by means of bolts, rivets, or any suitable fastening.

Sixthly, in the "peculiar manner of constructing an iron frame  
 apted to a covering of wood for the sides, bilges, and bottoms,

“ and combining with the frame a timber stem, a timber keel, and  
“ a timber stern post.”

Seventhly, in “the peculiar manner of constructing the keel  
“ plate, the stem plate, and the stern plate.” The plate is so bent  
as to form “an apron or holding for the ends of the external  
“ planking of the sides, bilges, and bottom.”

Eighthly, in “the peculiar manner of constructing the keelson  
“ or keelsons” either “with the extremities of a curvilinear form,  
“ and fastened to the stem and stern plate to keep the ends of the  
“ vessel from drooping ;” “or by putting the keelson down upon  
“ the keel plate abutting the ribs, so as to fasten the keelson to  
“ the keel plate, also abutting the floorings so as to fasten the  
“ keelson to the ribs.”

Ninthly, in “the peculiar manner of constructing the vertical  
“ and horizontal stringers.” “In the wake of the upper and lower  
“ deck beams I place on the outside of the ribs stringers of plate  
“ iron, or plate-iron binding strakes all round the vessel, and  
“ fasten the same to each rib, and also to the stem plate or apron  
“ forward, and to the stern plate aft.” There will also be hori-  
zontal stringers on the ends of the beams, fastened to each rib, to  
each beam, and, if necessary, to the vertical stringers.

Tenthly, in “the application of rolled iron of a bridge form,  
“ similar to a ‘bridge rail’ as ribs, in the construction of the iron  
“ frame.”

Eleventhly, in “coating the bottoms of vessels navigating on  
“ water with a mixture of gutta percha and black lead, and also  
“ such parts as are made of iron.”

[Printed, 1s. 4d. Drawings. See *Mechanics' Magazine*, vol. 52, p. 377; and  
*Patent Journal*, vol. 9, p. 56.]

A.D. 1849, November 2.—N° 12,826.

VIDIE, LUCIEN.—This invention consists, firstly, in “indicating  
“ to passengers the progress and position of conveyances on land  
“ by means of visual signals.”

Secondly, in “indicating to the guards of a train, by means of  
“ certain visual signals, the carriage which the passengers want to  
“ have opened.”

Thirdly, in “indicating, by means of visual signals to passen-  
“ gers, the progress and position of conveyances on water.”

[Printed, 10d. Drawings. See *Mechanics' Magazine*, vol. 52, p. 376, also  
vol. 53, p. 33; and *Patent Journal*, vol. 9, p. 166.]

A.D. 1849, December 19.—N<sup>o</sup> 12,901.

**BERTHON, EDWARD LYON**—"Certain instruments for ascertaining and indicating the course or way, velocity, trim, and draught of ships, and the rate of currents, also for discharging water from ships, and for taking altitudes and levels on sea and on land."

First, the instrument patented on the 20th of June, 1849, for showing the velocity of ships, the course or way, and draught of ships, and rate of current, in its improved state.

Secondly, "the peculiar adaptation of the negative force obtained by turning the port of a projecting discharge pipe at the angles described for the purpose of" discharging "water from vessels." "A short strong hollow pipe" is fixed in the ship's bottom, on the inside, with a stuffing box on the top. Through this pipe projects a discharge pipe, closed at bottom, and with a fine-edged orifice in one side, near the bottom. This latter pipe has a hollow vessel at its upper end, shaped like a pear, with the small end upward. Within this vessel, there is a light sphere of hollow metal, or of wood, or gutta percha. To the upper or conical end of the vessel is attached a hose, and the passage into it is smaller than the sphere. The action is as follows: When the discharge pipe is pushed down into the sea below the ship, and the orifice turned sideways, i.e., when its axis is at right angles to the line of motion, the maximum negative force is obtained when the ship is in motion. If then the free end of the hose be plunged into the water in the hold to be discharged, the negative or depressing force will draw it down through the discharge pipe into the sea, provided the velocity of the ship be sufficient; but when the velocity is not great enough to produce such an amount of negative force the sphere rises, and closing the passage to the hose, prevents the influx of water.

Thirdly, "the instrument for taking altitudes and levels on sea and on land."

And, fourthly, "the improved clinometer for ascertaining the trim or list of vessels, in so far as regards the peculiar mode in which two fluids of different specific gravities are therein employed for the purposes of the instrument"

[Printed, 1s 6d Drawings. See *Mechanics' Magazine*, vol. 22, p. 201, also vol. 23, p. 61, and *Patent Journal*, vol. 9, p. 143.]

A.D. 1850, January 19.—N° 12,934.

LAIRD, MACGREGOR.—“Improvements in the construction of  
“ metallic ships or vessels, and in materials for coating the bottoms  
“ of iron ships or vessels, and in steering ships or vessels.” “Ac-  
“ cording to my invention, I employ corrugated metal for the  
“ external surfaces of ships or vessels, causing the corrugations  
“ to run longitudinally at the sides of the ships or vessels in a  
“ direction from stem to stern.” “The frames, when any are  
“ used, may be made with angle iron or other bars.” In order to  
employ sheets with like corrugations from stem to stern of a boat  
or vessel, as the plates approach the stem or stern, the edges of the  
plates must be cut off, in which case the form and size of the  
corrugations will be the same from end to end of a boat or vessel;  
“ or in place thereof I can raise the plates to be formed by ham-  
“ mering them on or into a mould, or by rollers, so as to produce  
“ corrugations in such manner as to cause them to decrease regu-  
“ larly from the widest corrugation up to nothing at the bow” or  
stern.

“Another improvement in building ships or vessels consists of  
“ employing as framing hollow sheet metal to obtain stiffness with  
“ lightness. For this purpose, supposing I wish to give strength  
“ to a ship or vessel (constructed of ordinary sheet metal) in a  
“ direction fore and aft, then I employ either externally or inter-  
“ nally sheet metal frames, each bent into a hollow or trough-like  
“ form, with flanches on either side.”

Secondly, “I build boats or vessels in sections with internal  
“ flanges in such manner that they may go together by screw  
“ bolts and nuts or otherwise, so that common or unskilled labour  
“ may be employed abroad to put the parts together.”

Thirdly, I “form the decks with corrugated iron, and I fill the  
“ corrugations, and render the whole flush, with asphalte.”

Fourthly, building metal “ships or vessels with longitudinal  
“ and transverse bulkheads, to facilitate the carrying cargo in  
“ bulk.”

On the 19th July, 1850, a disclaimer was filed, of all that part  
of the title which is contained in the words “and in materials for  
“ coating the bottoms of iron ships or vessels, and steering ships  
“ or vessels.”

[Printed, 7d. Drawings. See Repertory of Arts, vol. 16 (*enlarged series*),  
p. 134; London Journal (*Newton's*), vol. 37 (*conjoined series*), p. 33; Me-  
chanics' Magazine, vol. 53, p. 76; and Patent Journal, vol. 9, p. 186.]

A.D. 1850, February 21.—N° 12,973.

**HÉDIARD, ALEXANDRE.**—This invention consists in “the employment of one or more pistons or propelling agents, acting by “one of their faces upon the water near the bottom of the vessel.” These pistons either pass through apertures in the bottom of the vessel by the side of the keel, or they are placed between two keels, and act in a sort of canal formed by the double keel.

[Printed, 10*s*. Drawings. See *Mechanics' Magazine*, vol. 53, p. 159 and *Patent Journal*, vol. 9, p. 273.]

A.D. 1850, March 23.—N° 13,016.

**SIDDELEY, JOSHUA, junr.**—The invention consists, first, in so arranging the different parts of the caboose or cooking apparatus (the parts of which are to be made of iron or other suitable metal or material), as to economise considerably the space or room requisite for cooking purposes, and also to increase the power and capabilities of the cooking arrangements, with a considerable saving of fuel.

Secondly, in “the introduction of tubes or pipes as component parts in the erection of berths in passenger and other ships, to “be used as a conveyance for water for the general use of passengers and crews, or for any other purposes that may be “requisite.”

Thirdly, in the application and arrangement of rollers in single, double, or other rows, round the pins of sheaves for blocks, so that they may revolve with the centre or pin, whereby the ordinary amount of labour, wear, and tear may be very considerably reduced.

[Printed, 1*s*. Drawings. See *Mechanics' Magazine*, vol. 53 p. 258; and *Patent Journal*, vol. 9, p. 31.]

A.D. 1850, June 1.—N° 13,095.

**TUCKER, JOHN.**—(*A communication.*)—The invention consists, —“Firstly, in an improved steam boiler.”

Secondly, in improved apparatus for screw propelling, “by “which the screw is fixed so as not to interfere with the dead “wood” or “stern post of the vessel.” The screw shaft is placed parallel to its ordinary position, but out of the middle line, and it extends sufficiently far aft to allow the screw to work abaft

the rudder. A small notch is cut in the rudder in the wake of the shaft, to allow of its being put hard up or down. Above the main shaft there is another shaft, by means of which, and of a metal arm, the screw may be "topped up to the counter."

Also in a four-armed screw, fitted with wrought-iron bands or belts, securely fixed to the outer rims or edges of the arms or floats of the screw, and serving to protect them when working through ice or in an action.

Thirdly, in apparatus for cleansing the sides and bottoms of vessels when afloat. Near each end of the ship a chain is hooked to a ring bolt in the side, then the bight is cast under the keel, and being caught and retained in its place by a cleft or notch, the end is brought up on the other side of the vessel, and is made tight by a tackle fixed to the end of it, and attached to a purchase on deck. To each of the chains thus secured is affixed a short bar, provided with two loose rings, which allow it to slide freely along the chain; the bar being kept in the position required by small ropes rove through pulley blocks, and carried inboard. This bar is to adjust a scrubbing brush in the various positions requisite for cleansing the vessel. The remainder of the apparatus consists of a scrubbing brush, to which an air vessel, constructed of thin sheet iron or copper is attached, to give it buoyancy, and enable it to be moved with facility. The brushes are moved horizontally by ropes passing through pulley blocks attached to the sliding bars, and carried inboard, where they are hauled backwards and forwards by the crew.

[Printed, 1s. 4d. Drawings. See *Mechanics' Magazine*, vol. 53, p. 473; and *Patent Journal*, vol. 10, p. 117.]

A.D. 1850, June 8.—N° 13,109.

NEWTON, WILLIAM.—(*A communication.*)—The invention relates, first, "to the application of caoutchouc or india rubber to "the making of various articles of manufacture and wares," "particularly such as are formed in or on moulds."

"For tow lines or other ropes, india rubber vellum cords may "be wound on to a cord or rope composed of hemp or other like "substance, or of metal wire."

Secondly, it relates to making "cellular india rubber cloth."

Thirdly, "to the method of making what I denominate 'strong "cloth,' which is composed of india rubber, and a bat or fleece of

" cotton or other fibrous substance." " When it is desired to give  
 " the fabric great strength, and render it applicable for ships' sails  
 " or other like purposes, I place, either by hand or machinery,  
 " fibres, threads or cords, or strips, or wires, at suitable distances  
 " apart from each other, parallel or crossing each other, or other-  
 " wise arranged between two sheets of the fabric, which are to be  
 " united, or cement the threads, cords, strips, or wires, upon the  
 " surface of the fabric."

On the 7th December, 1850, the inventor disclaimed that part  
 of the title of the invention which related to improvements in  
 elastic material for stuffing cushions.

[Printed, 6s. No drawings. See Repertory of Arts, vol. 20 (*enlarged series*), p. 147, and p. 194 for disclaimer, London Journal (*Newton's*), vol. 4 (*enlarged series*), p. 33, Mechanics' Magazine, vol. 33, p. 476, and Patent Journal, vol. 11, p. 2.]

A.D. 1850, June 19,—N<sup>o</sup> 13,136.

GREENWAY, CHARLES.—" Improvements in ships' and other  
 " pumps, in anchors, and in propelling vessels."

The invention relates, first, to an arrangement of valve suitable  
 for ships' and other pumps. The valve consists of two parts, the  
 object being to increase the water way, and facilitate the action.  
 The lower part of the valve is perforated, and has a hollow stem  
 which receives and guides the stem of the upper part. On causing  
 water or other fluid to flow through the valve, these two parts  
 will be separated, one disc rising above the other, and the liquid  
 will be divided into two streams; " in like manner may valves be  
 " divided into three or other number of parts, by which three or  
 " other number of distinct streams may be obtained "

Secondly, to " forming anchors by cutting or stamping out of  
 " sheet metal a series of parts each of the form of an anchor, in  
 " place of forming anchors of bar iron, and by piling, welding,  
 " and forging, as heretofore."

On the 19th of December, 1850, a disclaimer was filed, of all  
 that part of the title which is contained in the words, " and in  
 " propelling vessels."

[Printed, 7d. Drawings. See Repertory of Arts, vol. 17 (*enlarged series*),  
 p. 47. London Journal (*Newton's*), vol. 34 (*enlarged series*) p. 34. Me-  
 chanics' Magazine, vol. 53, p. 517, and Patent Journal, vol. 10, p. 151.]

A.D. 1850, June 24.—N<sup>o</sup> 13,149.

LAIRD, WILLIAM.—(*Partly a communication.*)—“ Improve-  
“ ments in life boats, and in apparatus for filtering and purifying  
“ water.”

The improved life boat may be about ten feet long, four feet wide, and one foot three inches deep in midships, the floor or bottom flat, the ends sharp, but buoyant, and formed alike, to move either end foremost, so as to form a car or vessel shaped like a boat. An air tight bulkhead is placed across, about two feet from each end, and so as to leave about six feet of space between them, she will then float, even when the central space is filled with water. Over the whole a deck or cover is placed rising from the gunwales towards the centre, both lengthwise and across. Upon this deck an arched plate of metal is securely placed, so as to be air-tight. The intended effect of this arch, is to right the boat should she be overset. The vessel is completely shut in by a hatch in the deck. At each end of the boat is a chain with two rings, one a large ring to slide on a hawser, and the other a smaller ring to take a rope to a stranded vessel, or to the shore. The car boat being filled with passengers or cargo from the stranded ship, and completely shut in, is then to be hauled to the shore.

The invention consists, secondly, in filtering and clarifying water, by first employing “an outer jacket filled with an anti-  
“ septic substance for purifying the liquid from any disagreeable  
“ smell, taste, or noxious quality, and afterwards clarifying the  
“ liquid by passing it through a second filtering medium of  
“ porous stone, or artificial stone, or substance of a similar  
“ character.”

[Printed, 9d. Drawings. See Repertory of Arts, vol. 17 (*enlarged series*), p. 97; Mechanics' Magazine, vol. 54, p. 16; and Patent Journal, vol. 10, p. 190.]

A.D. 1850, August 22.—N<sup>o</sup> 13,233.

NEWTON, WILLIAM EDWARD.—(*A communication.*)—“ Im-  
“ provements in the construction of ships' magazines.”

The invention consists in “attaching a connecting piece, made  
“ of some easily melted or fusible material, to and combining the  
“ same with the governing cocks of the ejection and injection  
“ pipes employed for keeping a circulation of cold water through

" magazines, or for flooding the same when required ; such connecting piece being made of such materials, and adapted to the magazine or governing cocks connected therewith in such a manner, as to be affected by heat without necessarily coming in contact with the fire, this connecting piece being also governed by a spring, and being capable, when acted on by heat, of liberating certain other parts, which will open the cocks and flood the magazine " Also in " attaching and combining with the magazine a double tube or cylinder, or equivalent arrangement, by which articles may be conveyed into or from the magazine without in any way exposing the interior of the magazine to fire from without, by which several arrangements a perfect security is effected against firing the magazines of vessels of war."

[Printed, 7d. Drawings. See London Journal (*Newton's*), vol. 38 (conjoined series), p. 249, *Mechanics' Magazine*, vol. 64, p. 179, and Patent Journal, vol. 10, p. 271.]

A.D. 1850, August 22.—N<sup>o</sup> 13,235.

NEWTON, WILLIAM EDWARD.—(*A communication.*)—The principal object of the first part of the invention is to construct vessels propelled by stern propellers, in such a manner as to admit of employing a propeller of greater diameter, in proportion to the depth of midship section, than is usually employed. " In order to effect this object the vessel is made with the line of the keel inclined to the bulge line, the distance between these two lines being gradually greater towards the stern." Thus a much greater depth is obtained at the stern than at the bow and midship section, whilst the bulge line is parallel, or nearly so, to the water line, " so that the displacement of water is but slightly increased as the body of the vessel passes through the water." The second part of the invention relates to steam boilers.

[Printed, 10d. Drawings. See London Journal (*Newton's*), vol. 40 (conjoined series), p. 276, *Mechanics' Magazine*, vol. 64, p. 199, and Patent Journal, vol. 10, p. 290.]

A.D. 1850, October 10.—N<sup>o</sup> 13,276.

RUSSELL, JOHN SCOTT.—" Improvements in the construction of ships or vessels propelled by paddle wheels with a view to

“ better arming the same.” These improvements consist in constructing “ the projections or platforms fore and aft of the “ paddle wheel boxes, in such manner that advantage may be “ taken of these spaces for placing and working guns thereon, “ and so that they may be pointed and fired more in a line with “ the keel of a ship or vessel than guns near the middle of such “ ships or vessels have heretofore been.”

[Printed, 3*d*. No drawings. See Repertory of Arts, vol. 17 (*enlarged series*), p. 292 ; Mechanics' Magazine, vol. 54, p. 318 ; Artizan, vol. 9, p. 70 ; and Patent Journal, vol. 11, p. 28.]

A.D. 1850, October 24.—N<sup>o</sup> 13,293.

PASCAL, JEAN LOUIS.—“ An improved apparatus for the cure “ or prevention of smoky chimneys, and also for the ventilation “ of ships, rooms, and buildings in general.” This apparatus consists of an outer tube placed around the tube within which the smoke ascends, or by which the room is to be ventilated. Between this inner and outer tube, and at the lower part of the latter, are placed certain inclined and curved plates of metal connecting the two tubes together, “ and arranged so that the wind or current of “ external air striking upon them will be reflected, and cause an “ upward current between the two tubes. Above the inner tube “ is placed a fan capable of revolving about an axis, and with “ three or four plates or vanes arranged in such manner as that “ the ascending current of rarified or heated air, or the current “ pushed between the external and internal tubes, or the two “ currents combined, may cause the fan to rotate about its axis, “ and act as an exhauster, and thus improve the draft of a chim- “ ney above which it may be placed, or ventilate any apartment “ or place into which the inner tube may lead.”

[Printed, 6*d*. Drawings. See Mechanics' Magazine, vol. 54, p. 137 ; and Patent Journal, vol. 10, p. 222.]

A.D. 1850, November 2.—N<sup>o</sup> 13,307.

BATEMAN, JONAS.—“ Improvements in life-boats.” Let a boat frame be constructed of any approved material, and of suitable dimensions, the frame being strongly fastened to cross partitions about one inch and a half in thickness ; the deck and bottom of the boat to be precisely similar in size, and the deck to have circular holes cut to receive cylinders. Strong water-tight cylinders

about sixteen inches in diameter, and thirty-six inches in depth, are then to be passed through the holes in the deck, and firmly secured to the bottom of the boat. "Then with prepared cork  
 " entirely fill the whole of the interstices between each of the  
 " cylinders and the inside of the boat frame, so as to render the  
 " whole a solid mass, with the exception of the interior of the  
 " cylinders, each of which is intended to receive one person,"  
 " after which pass a flexible waterproof article round the open  
 " end of each cylinder," to be tied round the waist of the person using the boat. "A strong wrought-iron keel, about three inches  
 " wide by two inches thick, is to be fastened to the outside of the  
 " bottom of the boat."

[Printed, *et* Drawings. See Repertory of Arts, vol. 17 (*enlarged series*), p. 356; *Mechanics' Magazine*, vol. 54, p. 377; *Artisan*, vol. 9, p. 20; and *Patent Journal*, vol. 11, p. 62.]

A.D. 1850, November 9.—N<sup>o</sup> 13,330.

SCOTT, JAMES.—"Certain improvements in docks, slips, and  
 " apparatus connected therewith." Along each side of the dock or excavation are driven a row of piles, placed in pairs near together, and supported by inclined piles. In the space between each pair of piles is placed a long hydrostatic cylinder, having a flange cast on its upper end for resting upon the heads of the piles. The cylinders thus hang down between the pairs of piles, which latter bear the whole weight and strain in working. The rams or plungers of these cylinders are fitted with saddle heads on their upper ends, to fit into the bends of straps or double connecting rods, the lower ends of which rods are bolted or otherwise attached to transverse beams beneath. By this arrangement the entire weight of the vessel is thus communicated from a platform and keel blocks resting on the transverse beams to the rams, and thence to the piles. At the landward end of the dock, a timber stage is erected to carry the actuating water pump. Shores or supports to the ship are attached at intervals, by hinge bolts at their lower ends, to the timbers of the platform. Adjusting chains to these shores are fastened to the centre of the platform under the vessel's keel, and are hooked at the other end, to a hook on the end of a short screw spindle carried in the head of the shore, and worked by a winch. When the ship, after being raised, is to be run off the platform on to dry land; a traversing carriage, consisting

of three or more lines of beams, supported on traversing wheels, running on corresponding rails laid down on the pier or shore, is run under her, and she is moved off "by a hydrostatic pressure apparatus" attached to the side of the carriage. The inventor sometimes uses blocks formed like an ordinary hydrostatic press of [short stroke, the cylinders having broad flanged bases, for supporting them upon the platform or floor of the dock or lifting apparatus.

The invention also consists in "constructing or arranging the supporting arms for the carriages of slips or ship-elevating apparatus, wherein one end of such arms may be disconnected from the carriage, so as to admit of the arms being turned to lay longitudinally along the side of the carriage."

It is further proposed to employ "double steam-heated pans or pots for heating or boiling pitch or other materials for shipwrights' use."

[Printed, 1s. 1d. Drawings. See *Mechanics' Magazine*, vol. 54, p. 399; *Practical Mechanics' Journal*, vol. 4, pp. 12 and 60; and *Patent Journal*, vol. 11, p. 98.]

A.D. 1850, November 12.—N° 13,340.

**WIMSHURST, HENRY.**—The invention consists, firstly, in improvements in "rotary steam engines."

Secondly, in so disposing the propeller in "auxiliary steam propelled vessels" that it may be conveniently raised up out of the water when required, and retained there at pleasure. Also "in the construction of a bow steering apparatus of one or more blades, so attached to the shaft that the angle at which they are placed with the axial line of the shaft may be readily changed, so as to stand in the most effective position;" and in fitting this improved steering apparatus "or other propeller, in the bows, or near to the stern of a vessel, with the shaft at right angles to the keel, so that when the propeller is put in motion the head of the vessel may at once be carried round to either quarter according to the direction in which the apparatus is made to revolve." A further improvement "in relation to marine propelling consists of an apparatus for measuring and indicating the effective duty of propellers," and "for disconnecting them from the steam engine, and turning round the engines and machinery connected therewith when the steam is not up."

Thirdly, in "an improved mode of constructing tug and other

" vessels. I propose to build them with an aperture through the  
 " bow or fore part, sufficiently large to contain the steering  
 " apparatus before described, with its shaft or axis laid 'athwart  
 " 'ships;' that is, crosswise and at right angles with the keel."

" Another improvement in the construction of vessels consists  
 " in forming the run or stern post of vessels either of wood or  
 " iron, with metal plate or plates upon it, for the purpose of  
 " carrying the propeller shaft bearing. When the propeller itself  
 " is placed abaft the rudder great additional strength is given to  
 " the stern post of the vessel."

[Printed, 3s 7d. Drawings. See *Mechanics' Magazine*, vol. 54, p. 413, and  
 vol. 55, pp. 281 and 301, and *Patent Journal*, vol. 11, p. 136.]

A.D. 1850, November 19.—N° 13,353.

LAIRD, WILLIAM, and COWPER, EDWARD ALFRED.—"Im-  
 " provements in machinery for loading and discharging certain  
 " descriptions of cargo in ships and other vessels, and in the con-  
 " struction of such vessels."

This invention consists in "the application of an endless chain  
 " of buckets or blades for the purpose of lowering coal and similar  
 " descriptions of cargo into ships and other vessels," and "of an  
 " endless web or chain, placed horizontally or nearly so, for the  
 " purpose of conveying and distributing coal and similar descrip-  
 " tions of cargo within the holds of ships and other vessels."

Also, in lowering coal and similar descriptions of cargo into ships  
 by means of a trunk, which is kept constantly filled, so that the  
 coal may descend gradually as it is withdrawn from below, instead  
 of dropping unchecked to the bottom. Also in the application of  
 a railway, suspended to the deck beams, for the purpose of loading  
 and discharging cargoes. And in "constructing vessels of a  
 " series of separate chambers or boxes which themselves form the  
 " sides of the vessel, and which are kept in their proper relative  
 " positions by an open frame into which they are dropped, and  
 " which frame is supported by being rendered buoyant in itself,"  
 or by being attached to a buoyant chamber or caisson at each end.  
 "The outer sides of the boxes form themselves into the shape of  
 " a boat, and each box has sufficient buoyancy to support a  
 " certain proportion of the cargo."

[Printed, 2s 1d. Drawings. See *Mechanics' Magazine*, vol. 54, p. 419, and  
*Patent Journal*, vol. 11, p. 88.]

A.D. 1850, November 30.—N° 13,377.

**ELMSLIE, JAMES AUGUSTUS, and SIMPSON, GEORGE.**—The invention consists, first, in an improved mode of sheathing the bottoms of ships and vessels by “dispensing with the use of  
“felt or paper materials between the bottom of the vessel and the  
“ordinary metal sheathing, and employing in lieu thereof any  
“description of metals or alloys of metals known under the  
“denomination of tin, tinfoil, or other metals or alloys of metals  
“of a like ductile nature.” Before applying the sheathing, thin sheets of tin, tinfoil, or other like metallic alloys are brought upon the bottom of the vessel, and pressed closely upon the planking. By laying one sheet of this material over another, and fastening the same with copper tacks, they may be made quite impervious to wet. This may be done either with or without adhesive cement under them. “The sheathing of tin, tinfoil, or other metallic  
“alloy being thus laid on, a layer or coating of tar or its compound may be applied,” and the ordinary copper, or copper alloy sheathing, applied and secured in the usual manner.

Secondly, in “an improved mode of manufacturing cartridges.”

Thirdly, in “an improved mode of manufacturing the pellets  
“or wads of fire-arms and cannon.”

Fourthly, in “an improved mode of manufacturing rockets and  
“other descriptions of fireworks requiring cases or envelopes.”

[Printed, 5*d*. Drawings. See *Mechanics' Magazine*, vol. 54, p. 457; and *Patent Journal*, vol. 11, p. 133.]

A.D. 1851, January 2.—N° 13,435.

**TATHAM, JOHN, and CHEETHAM, DAVID.**—The eighth part of this invention, consists in the application of a system of pipes to steam ships, from which steam may be allowed to flow at pleasure for the purpose of extinguishing fire.

[Printed, 2*s*. 5*d*. Drawings. See *Mechanics' Magazine*, vol. 55, p. 38; and *Patent Journal*, vol. 11, p. 199.]

A.D. 1851, February 10.—N° 13,503.

**BROWN, JOHN HARCOURT.**—The invention consists, first,  
“in constructing ships, boats, and other vessels with double  
“keels,” “each keel being the portion of” a central “arch or

" corrugation, varying in distance from each other of twelve inches, " and being from fifteen inches in depth to any other required space," and with a " double or duplex rudder, adapting the screw " propeller or paddle wheel for the propulsion of the same "

" Secondly, in constructing ships, boats, rafts, buoys, and other " vessels out of hollow tubes or cases, which comprise the frame- " work of the same," and are composed of gutta-percha by itself, or in combination with suitable substances. These tubes are stayed across, and have insertions of timber at certain distances, for securing " the bolts, pins, knees, and other fastenings."

[Printed, 1s. 2d. Drawings. See *Mechanics' Magazine*, vol. 35, p. 139, and *Patent Journal*, vol. 11, p. 220.]

A.D. 1851, February 22.—N<sup>o</sup> 13,520.

**RICHARDSON, HENRY.** " Certain improvements in lifeboats." The invention consists in forming lifeboats of two or more longitudinal tubes or pontoons, of iron, copper, or other suitable material, " each tube or pontoon being constructed with several " water-tight compartments or divisions. These tubes or pon- " toons are braced or connected together by wrought iron trans- " verse stays, and upon these stays an open or latticed deck " formed of timber is laid "

[Printed, 8d. Drawings. See *Mechanics' Magazine*, vol. 55, p. 177, also vol. 58, p. 212, and *Patent Journal*, vol. 11, p. 13.]

A.D. 1851, May 13.—N<sup>o</sup> 13,632.

**CARPENTER, EDWARD JOHN.**—This invention consists in constructing ships or vessels with " a water space formed out of " the hull for screws and other submerged propellers to work in, " by the removal of the ordinary rudder, stern-post, dead wood, " and after part of the keel," and enclosing the space heretofore occupied by these parts " within a strong framework open to the " water both fore and aft, and beneath," the two sides terminating at bottom in two additional keels or bilge pieces parallel to the main keel.

Secondly, in the employment for the propelling of ships and vessels, of two propellers placed in the water-space so formed, the one a little in advance of the other, and capable of being worked either both at a time, or one at a time only.

Thirdly, in an improved form of propeller " having blades, " parts of which are flat and parts curved."

And, fourthly, in improved arrangements for raising propeller blades out of the water, or "feathering" them, without raising or shifting the propeller shaft along with them.

[Printed, 10d. Drawings. See *Mechanics' Magazine*, vol. 54, p. 461, vol. 55, p. 401, and vol. 58, p. 96; and *Patent Journal*, vol. 12, p. 100.]

A.D. 1851, May 22.—N° 13,638.

**TATE, GEORGE.**—The invention refers, firstly, "to the construction of dwelling houses, and chiefly to those of the humbler class."

Secondly, "to buildings in which water-closets, cesspools, drains, water pipes, and sewers are employed."

Thirdly, to the preparation of timber "by forming an insoluble precipitate within the pores of the wood."

Fourthly, to improved modes of constructing bridges, beams, and girders.

Fifthly, to the use of "air and water-tight materials for collapsible vessels suited for constructing buildings to be used for temporary and military purposes."

Sixthly, "to the adaptation and manufacture of materials to be employed in buildings."

Seventhly, to the construction of the hulls of floating vessels like barrels or tubs, i.e., by staves bound together with hoops. "I also construct floating vessels of corrugated metal, and of corrugated artificial material secured and bound together by hoops." After the "tub-like" portion is completed the external form is given by blocking out with the required timbers and planks and forming a suitable deck. "Suitable apertures may be made by cutting out after this part is formed at the deck and sides of the tub-like part, as may be necessary, or it may be without apertures or communications with the upper part of the vessel, and filled with any material of less specific gravity than water, and divided into water-tight compartments, the freight, passenger, and store portions of the vessel being entirely distinct from it."

"I also construct floating vessels with one or more sets of revolving buoyant supporters which shall effect the floatation of such vessels, and whereby the motion of the same through the water will be facilitated."

"I also construct such floating vessels by combining with such revolving buoyant supporters two or more chambers divided

" into a number of air and water-tight compartments charged  
 " with air, or with materials of less specific gravity than water."

" I also construct revolving life boats suspended from a frame  
 " supported by revolving buoyant supporters."

" I also construct floating vessels, to lengthen or shorten when  
 " required, by having one tube sliding within another, like a  
 " telescope, the extreme ends being stopped in an air and water-  
 " tight manner, and one furnished with a tap for inflating the  
 " same with air or gas, if required."

[Printed, 6s. 4d. Drawings. See *Mechanics' Magazine*, vol. 55, p. 438; and  
*Patent Journal*, vol. 12, pp. 98 and 110.]

A.D. 1851, June 12.—N<sup>o</sup> 13,659.

**BERTHON, EDWARD LYON.**—The invention has relation:—  
 Firstly, "to the construction of boats generally, and more  
 " especially to the class of boats called life boats, and to boats  
 " for the transport of ordnance and other heavy bodies across  
 " rivers (sometimes called pontoons or floating bridges), and con-  
 " sists in constructing them in such manner as to combine  
 " adequate capacity and strength, with the property of being  
 " collapsible at pleasure, into a small compass." "The timbers are  
 " all made flat and broad, say two inches in thickness, and from  
 " eight to fifteen inches in breadth, and they are jointed together  
 " at the ends (both of which are alike) by chain hinges." The  
 stem block is "a strong semi-cylindrical block of wood, which is  
 " firmly attached to the stem or end of the keel-piece turned up.  
 " Around this stem block the ends of all the timbers are made to  
 " abut when the boat is open, by the directing action of the chain  
 " hinge," "which then takes a semicircular curve; but when the  
 " boat is shut the chain hinge assumes a horizontal position,"  
 allowing the timbers to fall into parallel planes. There is an outer  
 sheathing or envelope, composed of any flexible waterproof  
 material, which is attached by nails and cement to the outer edges  
 of the timbers; and "an inner lining of similar material, which is  
 " similarly attached to the inner edges of the timbers. The sides  
 " and bottom of the boat are thus divided into ten distinct  
 " longitudinal compartments or cells, which extend lengthwise  
 " from stern to stem, and are intended to contain air drawn in  
 " through openings at the extreme ends while the boat is in the  
 " act of being expanded." When the boat is shut, the flooring

risers in the middle, and stands up like the roof of a house; and when open, it drops down and rests on the timbers, and on the keel. "The thwarts also rise and fall like the flooring, and all these together perform the part of extenders when the boat is open."

Secondly, to an improved sounding instrument, "in so far as regards the employment of the difference in specific gravity between the sea water and that of a lighter fluid contained in a tube communicating therewith to shew at all times the depth of such sea water."

Thirdly, to an improved instrument for indicating the rise or fall of water.

Fourthly, to an instrument for ascertaining and indicating the rate of currents.

[Printed, 1s. 5d. Drawings. See *Mechanics' Magazine*, vol. 55, p. 481; and *Patent Journal*, vol. 12, p. 145.]

A.D. 1851, June 22.—N<sup>o</sup> 13,698.

DUNDONALD, THOMAS, EARL OF.—The invention consists in the construction and manufacture of useful and ornamental objects "by the adaptation and use of the bitumen, petroleum, or natural pitch of Trinidad and of the British North American Colonies, in the construction and manufacture thereof." Pieces of cloth, or other such material, may be coated with the said imperishable bitumen on one or both sides, "by having solutions of bitumen applied to them, either by a brush or other convenient means, and, if necessary, several coats of the solution may be applied, until a covering of the said bitumen of the requisite thickness is obtained." Combinations of bitumen and cloth, made in this manner, "will form sheets of various descriptions, which may be applied to various purposes, such as coverings for ships' bottoms (between the vessel and the metallic sheathing)," &c.

[Printed, 10d. Drawings. See *Repertory of Arts*, vol. 19 (*enlarged series*), p. 289; *London Journal (Newton's)*, vol. 40 (*conjoined series*), p. 188; and *Mechanics' Magazine*, vol. 56, p. 98.]

A.D. 1851, September 4.—N<sup>o</sup> 13,736.

DRAKE, JOHN POAD.—Certain improvements by which "compass or thick timber" may "be superseded by plank or board" in building ships of the largest class, using, where it is possible, not "more than two close thicknesses" of such plank or board.

Also improvements in propelling.

The former patent of the inventor (No 7406) was confined in practice to the building of river craft; this is intended "to improve the building of ships and vessels of every class up to 3,000 tons or more."

The improvements are arranged in several classes, viz.: the compass or thick timber system; the plank timber, and double-boarded system; river barges and canal craft; iron ships, and vessels built of wood and iron conjointly; the flat bottom principle; the safety principle; and improvements in propelling.

The improvements in the compass or thick timber system are as follows:

The insides of the frame timbers of a ship of war, are to be covered with a ceiling, composed of two thicknesses of plank or board worked diagonally. Or the two thicknesses of plank may be replaced by a system of wood truss work; the heads of all the trusses in the middle part of the ship pointing towards midships. These are crossed by diagonal iron ties lying on them. Forward and aft there is a different arrangement, the iron tie plates being vertical.

"The general fastening to be composed of the dovetailed trenail and wooden screw so far as they can be appropriately employed."

In some cases the "filling frames" are to be single timbers instead of double, "compression blocks" of wood or cast iron being placed in the larger openings.

Or the frames may in every case be single timbers close jointed, every alternate one being formed of plank of about half the thickness of the ordinary timbers.

It is also proposed to have two keelsons, extending to the deadwood at each end of the ship.

In "the plank timber and double boarded system," the timbers are of plank bent to the required form, and planked inside and out with one or two thicknesses of board or plank. These plank timbers may be worked diagonally, having trusses between them. The two close thicknesses of board may be applied to boats, by radiating the inside thickness; and placing the outer one longitudinally.

The improvements in river barges and canal craft "consist in the formation of the bottom, which will not be diagonal;"

and "the removal of the inside framing or timbers, the sides being made a little thicker so as not to require further support." There is also an improved mode of attaching the beams to the side, and a better arrangement of gunwale.

With reference to iron ships, and vessels built of wood and iron conjointly, it is proposed to line them inside with a watertight wood ceiling. The arrangements shown are as follows:—Wood framing, and an iron skin outside, extending either over the whole surface, or only up to the water line, the rest being wood.

The iron plates may be united longitudinally, by continuous straps or stringers, overlapping both edges, and rivetting to them.

Angle-iron frames are sometimes to be employed, and they may be placed either vertically or diagonally.

The bottom may be formed "by iron plates united by perpendicular stringers" "instead of angle iron, over which is placed a perpendicular ceiling of one or two thicknesses."

The "flat bottom principle" "may be considered superior to the curvilinear principle for ships taking the ground, as the bilge, which in most vessels is the weakest part of the structure, will be on this principle the strongest."

According to this mode of construction the timbers of the frame do not extend below the bilge. The bottom of the vessel is framed independently by sleepers, keelsons, &c., and may be planked with two diagonal thicknesses or otherwise. A continuous knee or chine piece runs fore and aft at the heels of the timbers.

In applying the "safety principle," a "longitudinal vertical truss" is "to be ranged, in steam vessels, over the sleepers, nearest the side, clear of the boilers, and to allow sufficient breadth for the cabin, with space at the sides for sleeping berths, &c."

Merchant ships, and others intended for passengers and cargo, are to be fitted with impervious cabins, to keep the ship from sinking, if filled with water.

The engine rooms are also to be made water-tight and fire-proof, for the purpose of keeping the vessel afloat when she would otherwise founder.

The inventor describes by a drawing, not referred to in the text, various other improvements in attaching beams to the side, forming decks in two thicknesses, &c.

The improvements in "propelling ships and other vessels," comprise a mode of raising and lowering the shaft and wheels of

steam vessels, to regulate the dip of the paddle boards; a "self-feathering" paddle wheel; and "a series of drum paddle wheels, which, by being impervious or water-tight, will assist in keeping the vessel afloat if the hold should be filled with water, and prevent her rolling or inclining much under sail."

Also certain "modifications of the engine, engine frame, shaft, and crank, for improving paddle wheel propulsion."

[Printed, 10s. 4d. Drawings. See *Mechanics' Magazine*, vol. 56, p. 217.]

A.D. 1851, October 30.—N<sup>o</sup> 13,792.

SCOTT, MICHAEL.—The invention consists, first, in "improvements in machinery for punching, rivetting, bending, and shearing metals." "The machine is in principle a small hydrostatic press, and as it is essential to the case of application to the purposes intended, namely, punching, shearing, and rivetting on a vessel's side (or in other situations where it is desirable to save the labour of bringing the plates to a stationary machine), that its size and weight should be reduced as far as practicable, water is to be used under great pressure, say, one thousand lbs. per square inch." The die employed is "an ordinary die in every respect except that the face is made in the shape of a cup, for the purpose of causing the plate which is to be punched to be bent into it, thereby making a recess on one side of the plate, which will serve as a countersink for the rivet head, the punch going through the plate as usual."

Another part of the machinery is "a press for forming boats of sheet iron and producing corrugations."

Secondly, in a mode of forming iron vessels of thin plates at a distance apart. The ribs by which the two layers of plate are united, consist of two plates of wrought iron, of a width equal to the distance apart of the two shells, and bent to the mould of the ship; one of these plates is flat, the other has corrugations made in it, so that when the plates are rivetted together there will be spaces or passages left by the corrugations for rivets to pass through and attach the inner and outer plates of the ship to one another, and to the ribs. "I coat the inside of the plates which form the vessel with bitumen, and I fill the space between them with cocoa-nut fibre or other suitable material, saturated with bitumen or adhesive matter; by these means both air and water will be excluded."

Thirdly, in a mode of attaching sheathing to iron vessels. Tubes pass through both plates of the vessel, and are rivetted at both ends; other tubes, outside the former ones, serve to keep the plates at their proper distance apart, and enable the inner tubes to be rivetted. Treenails are then driven through a timber sheathing into the inner tubular rivets, and the copper sheathing may be nailed to the wood. In the case of single plated vessels, the tube has a flange by which it is rivetted to the vessel on the inside. Into this tube the treenail may be driven as before described.

Fourthly, in improved modes of forming the joints of plates, in building vessels. This consists in bending the edges of the plates outwards to a half-round, and clasping them together by strips of plates with their edges bent inwards. These strips are threaded along the two plates to be joined, and the whole is then passed between rollers.

Fifthly, in an improved mode of construction of iron masts. Two concentric tubes are formed of thin iron plate, between which are placed vertical ribs, formed in the same manner as the ships' ribs. The two tubes may be thus connected in the same way as the two layers of plates forming the bottom of the vessel. "The space between the rings is to be filled with cocoa-nut fibre or other suitable material, combined with adhesive matter."

Sixthly, in improvements in the internal arrangements of vessels intended to carry their cargo in bulk, consisting in having two wells, one forward and the other aft, communicating with each other by means of a tunnel or passage. "On each side of the passage there is a raised floor, which is united to the bottom of the vessel by means of the kind of rib before described."

[Printed, 2s. 10d. Drawings. See Repertory of Arts, vol. 19 (*enlarged series*) p. 333, and Mechanics' Magazine, vol. 56, p. 376.]

A.D. 1852, January 27.—N<sup>o</sup> 13,928.

BRUNET, JAMES JOSEPH. — (*A communication from Louis Armand*) — This invention has for its object the combination of wood and iron in ship building, in such manner, that the vessels shall possess the strength, lightness, and rigidity of those built wholly of iron, without extreme liability to fouling and corrosion, and to injury from shot. "A framing of timbers, but of considerably reduced scantling, and placed at a greater distance than usual from each other" "is to be formed and secured as generally done to the keel." An iron keelson formed of plate and angle iron is

substituted for the ordinary wooden keelson. Then a second framing of iron ribs, formed of double angle-iron rivetted together, or iron rolled somewhat in the shape of the letter Z, is introduced, extending from the under part of the deck to the iron keelson. "These iron ribs are bolted and secured to each of the timbers of the wood framing, which they cross diagonally at an angle of about  $45^{\circ}$ , and the lower ends of these iron ribs are continued forward or aft, so as to connect with and to form a part of the iron keelson." "When the diagonal iron frame is perfectly made fast, and rivetted securely together with the iron keelson, shelf-pieces, clamps, &c. &c., the outside planking, main wales, &c. may be proceeded with as commonly done, and bolted to the timber framing." Afterwards, longitudinal iron strakes are rivetted or bolted to the inner surface of the iron ribs.

[Printed, &c. Drawings. See *Mechanics' Magazine*, vol. 57, p. 116; *Practical Mechanics' Journal*, vol. 5, p. 135, and *Artizan*, vol. 10, p. 190.]

A.D. 1852, February 27.—N° 13,992.

MARE, CHARLES JOHN.—The invention relates "to arranging and combining apparatus to be used as templates to ascertain the correct form of the various metal plates used in the manufacture of iron ships or vessels, and boilers, and also the correct position required for the rivet, or other bolt holes required in putting such plates together. Heretofore, in constructing iron and other vessels and boilers, it has been usual, in order to get the correct form of the plates used in such manufactures, and the position of the various bolt holes, to hoist the plates into position, and hold them there temporarily, by clamping or otherwise."

[Printed, &c. Drawings. See *Repertory of Arts*, vol. 20 (*enlarged series*), p. 219; *Mechanics' Magazine*, vol. 57, p. 219; and *Practical Mechanics' Journal*, vol. 5, p. 180.]

A.D. 1852, March 4.—N° 13,995.

WILKINSON, GEORGE.—The invention consists of "a certain combination or arrangement of valve chest of ships' and other pumps, whereby the upper valve may be of larger diameter than the lower valve, and allow of the lower valve being got at and removed through the upper valve, and the parts connected with, and carrying such valves be greatly improved in their arrangement." The valve chest and the barrel are placed side by side,

and communicate with each other both above and below the piston, which is solid, and is perforated by two small holes covered by flaps. The suction pipe ascends into the valve chest, and on its upper part is fixed, or may be cast, an enlargement or cup, which retains water to cover the lower valve at all times ; this valve having its seat on the upper part of the suction pipe. The diameter of the upper valve, and the opening in its seat are such that the lower valve may readily be got at through the opening.

[Printed, 1s. 3d. Drawings. See Repertory of Arts, vol. 20 (*enlarged series*), p. 215 ; and Mechanics' Magazine, vol. 57, p. 236.]

A.D. 1852, March 24.—N° 14,034.

WHITE, JOHN, and WHITE, ROBERT.—The invention consists  
 “ in forming a solid keel from stem to stern of the same thickness  
 “ and depth throughout, with grooves or rabbits cut therein for  
 “ the reception of the diagonal planks, which do not cross the keel,  
 “ but terminate on each side of it in the grooves or rabbits. The  
 “ keel being laid in a continuous length, the floor timbers crossed,  
 “ and the kelson laid and bolted thereto at the commencement of  
 “ building, we obtain a permanent solid foundation on which to  
 “ construct the ship, the planking of the bottom is facilitated,  
 “ and one length of planking extends from the keel to the gun-  
 “ wale, the ship is much stronger than if the keel were cut to  
 “ allow of the diagonal planks being carried across it, and we are  
 “ also enabled to build ships with diagonal skins or coats of any  
 “ rise of floor.”

[Printed, 5d. Drawings. See Mechanics' Magazine, vol. 57, p. 290 ; Practical Mechanics' Journal, vol. 5, p. 179 ; and Artizan, vol. 10, p. 112.]

A.D. 1852, March 24.—N° 14,041.

MACINTOSH, JOHN.—“ Improvements in ordnance and fire-  
 “ arms, and in balls and shells.” The invention consists :—  
 “ First, of improvements in balls to be fired in succession from a  
 “ gun or fire-arm suitably arranged for igniting powder forward  
 “ of the outermost ball.”

Secondly, “ of improvements in balls or shells, whereby the  
 “ effect of explosion is made to take place all around and not  
 “ forward or backward.”

Thirdly, in employing vulcanized india-rubber, or collapsing material, to close a hole water-tight, up to which a gun may be run

below the water line of a gun boat or other vessel. "The gun, when to be fired, is to be run up to the opening and fired through the elastic mouth piece, which will close immediately after the passage of the ball or shell, not only by reason of its own elasticity, but also by the pressure of water thereon." When the gun is removed to receive a fresh charge, a slide is caused to cover the port hole, and thereby prevent the ingress of water in case of the collapsing of the india-rubber.

[Printed, 64d. Drawings. See Repertory of Arts, vol. 20 (*enlarged series*), p. 384, London Journal (*Newton's*), vol. 41 (*conjoined series*), p. 408, and Mechanics' Magazine, vol. 37, p. 297, and vol. 38, p. 131.]

A.D. 1852, May 8.—N° 14,118

TAYLOR, JOSEPH JEPSON ODDY.—The invention consists, first, in forming the sides, or a portion of the sides of ships, boats, or other vessels, of tubes or parts of tubes; or, in the addition of tubes or parts of tubes to vessels already built, thereby combining lightness with greater strength and buoyancy.

Secondly, in the application of tubes or parts of tubes to the construction of articles of ships' furniture, so as to render them buoyant.

[Printed, 9d. Drawings. See Mechanics' Magazine, vol. 57, p. 416.]

A.D. 1852, May 17.—N° 14,126.

PARRATT, GEORGE FREDERICK.—The invention consists in making a life raft capable of being expanded and contracted, which raft, when out of use, assumes a boat-like form, the construction being such that by reason of its having "wings or projecting hollow parts (composed of air and water-tight materials), it will when afloat possess large floating powers, and will offer a very extensive area for persons to be carried thereon." The wings or projections are to be of strong waterproof material, covered with strong netting; each may consist of one hollow chamber, or of several compartments, and by suitable valves and pipes or ways, they may be inflated.

"When the raft is out of use the projections or wings are empty, or nearly so, and are lashed to the sides of the boat or centre portion of the apparatus." When it is required to extend them, a bar equal in length to the entire spread of the wings, and which is pivotted in the centre of the boat, is swung from the fore and

aft into the athwartship position, and the wings are extended by pulleys fixed to the extremities of the bar.

[Printed, 8d. Drawings. See Repertory of Arts, vol. 21 (*enlarged series*), p. 84; and Mechanics' Magazine, vol. 57, p. 435.]

A.D. 1852, May 17.—N° 14,127.

NEWTON, WILLIAM EDWARD.—(*A communication.*) — “ Improvements in the construction of docks, basins, railways, and apparatus connected therewith, for raising or removing vessels or ships out of the water or on to dry land,” “ consisting principally in forming a floating dock of a series of separate sections which may be connected together in any desired number to suit the size or length of the ship or vessel to be raised, and which sections can be disconnected at pleasure. Each of these sections or compartments consists mainly of a water-tight hollow vessel or tank, which may be made of any suitable material.” “ They must be made water-tight so that they may be made to float when required, and they must be provided with valves or other suitable contrivances whereby water may be admitted into the interior and pumped out therefrom when required. At each end of each of these separate sections of which the dock is composed there is a strong wooden or other framing in which is fitted another hollow vessel arranged in such a manner that it may move vertically up and down in this frame. These end hollow vessels or floats are for the purpose of steadying the dock while rising.”

[Printed, 1s. 4d. Drawings. See Mechanics' Magazine, vol. 57, p. 435.]

A.D. 1852, May 22.—N° 14,130.

ROBERTS, RICHARD.—The invention consists:—“ Firstly, in constructing vessels with a passage outside the shrouds.” The plates forming the sides of the vessel are continued up six or seven feet above the deck, and a fore and aft iron bulkhead is worked within this. The space included between this bulkhead and the side is covered in to form a passage way, or cabins, the shrouds being attached to the base of the inner bulkhead and to the iron deck.

“ Secondly, in constructing vessels in such manner that light is admitted into almost every part through openings in the decks.”

In addition to the ordinary deck and side lights, apertures are made through the decks "in vertical and longitudinal series."

"Thirdly, in improvements in ventilating vessels," consisting in the application of perforated hollow beams intersected by trunk pipes, terminating in a lofty air pipe, "for which purpose, on board a sailing vessel, the mast may be made hollow, and furnished with openings near the top. In steam vessels I propose to surround the chimney by a casing" divided into compartments.

"Fourthly, in the peculiar application of hollow beams for supporting floors and for ventilating apartments." These beams, referred to above, are perforated near the upper side; a main trunk is secured on deck transversely to them, and portions of the deck are cut away where the trunk intersects the other beams, to afford a passage for the air.

"Fifthly, in an improved mode of rolling iron for beams and other purposes."

"Sixthly, in applying two hollow keels to single-hulled vessels, and dividing them into cellular compartments for stowing away goods, and for other purposes."

"Seventhly, in constructing iron vessels with longitudinal and transverse beams under the floor, and dividing the space between the floor and the bottom of the vessel into cells or compartments for the stowage of goods or water, which cells being secured by water-tight lids afford great strength and security to the vessel."

"Eighthly, in an improved mode of setting out the lines for the bows, and in giving a peculiar form to the stern of vessels, in order that they may glide with ease through the water, also in dispensing with the stern post or any substitute for the same."

"Ninthly, in applying to the cellular compartments under the floor of vessels tubes having an altitude greater than the vessel's draught, in order that the fresh water contained in them may, by superior pressure, "prevent the ingress of sea water."

"Tenthly, in improvements in storing fresh water, and in drawing it off for use." The "fresh water in the cells at the bottom of vessels is" to be put into "as many flexible bags as will, when full, be sufficient to fill the cell. These bags are furnished with union joints, by which they are connected to an ascending tube for the admission of air, and another ascending

“ tube, through which the bags are filled and the water drawn  
“ off, as required, by means of a common tap, which is placed a  
“ few feet below the light water line, that the salt water admitted  
“ into the cell may press the bags with sufficient force to make  
“ the fresh water flow freely from the tap;” so that the cells  
being kept full, the water will not wash about in them; the ship  
will not lose its water ballast; and the cells may be replenished  
with fresh water from a supply pipe, the pressure from which  
expels the salt water in the cells containing the flexible bags.

“ Eleventhly, in the adaptation of vessels for being anchored by  
“ the stern.” By dispensing with the parts known as the dead  
wood and the stern post; by having two rudders at the stern of  
the vessel; and by constructing the vessel with an inclined opening  
at the stern, in which anchors are kept ready for use.

“ Twelfthly, in improved modes of applying and constructing  
“ rudders.

“ Thirteenthly, in the peculiar construction of spiral vane pro-  
“ pellers, and the mode of communicating motion to them in  
“ certain cases.”

“ Fourteenthly, in an improved mode of connecting masts to  
“ the hull of vessels,” by stepping them into an iron socket,  
formed in an iron bulkhead.

“ Fifteenthly, in improved construction of anchors, whereby  
“ their strength and holding power are increased, and the working  
“ of them facilitated.”

“ Sixteenthly, in appliances for casting, heaving, fishing, and  
“ stowing away anchors.”

“ Seventeenthly, in an improved steam boiler.”

“ Eighteenthly, in an improved arrangement of steam boilers  
“ on board ship.”

“ Nineteenthly, in an improved arrangement and construction  
“ of coal bins, and in the application of railways and waggons for  
“ depositing coal on board ship.”

“ Twentiethly, in the application of self-acting watertight doors  
“ to the bulkheads of ships.”

“ Twenty-firstly, in an improved arrangements of steam engines  
“ on board ship.”

“ Twenty-secondly, in an improved method of disposing of the  
“ exhaust steam of steam engines.”

"Twenty-thirdly, in an improved life boat." This boat is so arranged that the seats are very low down, the legs of the passengers descending into an enclosed well running along the boat, and extending some distance below the bilge. The sides of the boat are composed of air vessels, or are lined with cork or other material of low specific gravity. It is propelled by "spiral vane propellers" driven by hand, and is fitted with "trimming fins," to keep the boat up against the pressure of the wind, and to check its tendency to roll.

"Twenty-fourthly, in the application of swivel fins for trimming vessels laterally, and in the application of T or angle iron to their exterior to check their tendency to roll." "I propose to adapt vessels of war for being inclined at pleasure to either side by means of trimming fins," "to effect which it will be necessary that the vessel be kept advancing at a speed probably of five to six miles an hour; so that, by increasing the immersion on the side next the enemy, the water shall prevent the balls from perforating the vessel much below the ordinary water line; the inclination of the vessel will at the same time facilitate the repair of damage done to the other side of it."

"Twenty-fifthly, in improved machinery for raising and lowering ships' boats."

"Twenty-sixthly, in improved apparatus for disengaging the boat from the lowering tackle."

"Twenty-seventhly, in the application of railways to facilitate the stowing away of the boats on board ship."

"Twenty-eighthly, in improved application and arrangement of spiral vane propellers."

"Twenty-ninthly, in peculiar application and construction of shields to ships of war to protect persons on board." The hull and decks of the vessel are supposed to be made of iron, and the sides are backed on the inside with some tough wood, such as lime tree, in lengths extending from deck to deck, where it is held by longitudinal planking, and fastened to the deck by angle iron, that the timber may readily be replaced. Flat wrought-iron shields are hinged to the top of the bulwarks all round the vessel, in such wise as to admit of being taken off and replaced with facility. The use of these shields is to protect the men from musket and grape shot, and the vessel from being boarded. They

are retained at the required angle by notch bars, similar in construction to those used to fasten swing window sashes.

“Thirtiethly, in the peculiar application and construction of sights to ships of war,” for the purpose of measuring ranges.

“Thirty-firstly, in an improved construction of gun carriage, gun railway, and mechanism for working guns.”

“Thirty-secondly, in improved machinery for raising cannon balls and cartridges from the store rooms to the decks.”

“Thirty-thirdly, in improved applications of leather, caoutchouc, and the like materials to the vents of vessels.”

[Printed, 3s. 3d. Drawings. See *Mechanics' Magazine*, vol. 57, p. 437.]

A.D. 1852, June 1.—N° 14,150.

NEWTON, ALFRED VINCENT. — (*A communication.*) — The invention consists in “the arrangement of the engines in a ship or vessel in a line fore and aft, with the open ends of the upper and lower cylinders towards each other,” “in combination with the working beam between the open ends of the cylinders, to form the connection with the crank shaft,” “whether the said engines be operated by the expansion of atmospheric air or other gas or steam;” and in “forming the working beams which are located between the open ends of the cylinders, when combined with engines arranged in a line, each with an arm extending into the open end of one of the cylinders, so that the connecting rods from the two beams shall take hold of and act upon the crank or cranks at right angles, or nearly so.”

Also in arranging caloric engines within a closed space or chamber, in ships or other vessels, “to protect the engine or engines from the injurious effects of water.”

[Printed, 10d. Drawings. See *London Journal (Newton's)*, vol. 42 (*conjoined series*), p. 194; and *Mechanics' Magazine*, vol. 57, p. 477.]

A.D. 1852, August 12.—N° 14,259.

ADAMSON, DANIEL, and COOPER, LEONARD. — The invention consists:—“First, in an improved construction of boilers for generating steam.”

“Secondly, in improved modes of uniting metal plates, to be used in constructing boilers, ships' tanks, and in other cases where great strength and good joints are required.” It is pro-

posed to unite the plates by bending the edges at right angles, thereby forming flanges, which flanges are then either rivetted or welded together, a plate being interposed if desirable

"Thirdly, in improved modes of constructing and working the  
"expansion valves of steam engines, and of regulating the  
"amount of steam admitted to the cylinders of steam engines,  
"according to the load."

"Fourthly, in improvements in the construction and application  
"of air pumps for condensing steam engines, and in the pistons  
"to be used in air-pumps and other cylinders.

"Fifthly, in improvements in the apparatus for heating or  
"rarefying steam as it passes from the steam generator to the  
"cylinder of the steam engine ;"

"And, lastly, in heating or rarefying steam between the high-  
"pressure and low-pressure cylinders of compound steam-  
"engines."

[Printed, 1s. 1d. Drawings. See *Mechanics' Magazine*, vol. 53, p. 175.]

A.D. 1852, October 23.—N<sup>o</sup> 14,335.

**McGAVIN, ROBERT.**—This invention consists in adding to, or mixing in the iron of which ships are to be built, a small proportion of arsenic. "The effect of such admixture with or  
"treatment of the iron is, that the resultant gradual feeble  
"solution of the poisonous matter in the water destroys or  
"prevents the adhesion of all barnacles and marine animal pro-  
"ductions of every kind, and thus no hold is afforded for the  
"foreign matters which ordinarily cling to the fundamental  
"animal formations." The necessary amount of arsenic, is from two to five per cent. of the iron.

[Printed, 2½d. No drawings.]

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## PATENT LAW AMENDMENT ACT, 1852.

A.D. 1852, October 1.—N<sup>o</sup> 4.

HODGSON, JAMES.—The invention consists in dispensing with the use of ribs and beams in constructing iron ships and vessels, and obtaining the desired strength by the simple use “of sheet iron rivetted together in like manner to that pursued in boiler making. In applying bulkheads in such ships or vessels they are fixed to” additional “plates rivetted to the interior of the body of the vessel. The decks are made of sheet iron, and the gun-wales formed without beams, and wood decks are fixed thereto.”

[Printed, 2½d. No drawings.]

A.D. 1852, October 1.—N<sup>o</sup> 8.

WRIGHT, RICHARD.—“The improvements in constructing vessels consist in forming a ship or vessel with three floating parts, parallel with each other, having channels between them.”

“Also, the vessel being formed with three floating parts, means are provided for ejecting the leakage water from each by an air pump; the air presses upon the surface of the water,” and discharges it through pipes.

[Printed, 4½d. Drawings.]

A.D. 1852, October 1.—N<sup>o</sup> 22.

WOOD, HENRY WALKER.—(*Letters Patent void for want of final Specification.*)—The “improvements in the construction of ships and other vessels consist, first, in rendering them more buoyant, so as to skim as much as possible upon the surface of the water, and I do this by making the lower part or parts hollow, and air and fluid tight.”

[Printed, 2½d. No drawings.]

A.D. 1852, October 1.—N<sup>o</sup> 37.

POOLE, MOSES. — (*A communication from Mr. Goodyear.*) — Improvements in covering and sheathing surfaces, such as ships,

bottoms, &c., with a material not hitherto used for such purposes. These consist in "employing sheets or surfaces of a hard material, produced by combining india-rubber with sulphur, with or without other materials, and subjecting the same to heat."

[Printed, 2½d. No drawings.]

A.D. 1852, October 1.—N° 103.

LUNGLEY, CHARLES.—The improvements consist,—“Firstly, in constructing ships with diagonal iron plates laid on the inner longitudinal skin of wood (which skin is placed on the outside of the iron frames or ribs in the ordinary manner), and between the inner and outer skins of wood. The iron plates are disposed diagonally crossing each other, and are fastened to the inner frames, and the outer skin of planking is screwed to the inner skin.

“Secondly, in constructing ships with an inner skin of diagonal planks laid on the ribs or frame, then with iron plates laid diagonally across the diagonal wood skin, and with an outer skin of longitudinal planking screwed to the inner skin.

“Thirdly, in constructing ships with the frames or ribs placed diagonally, and a skin of wood laid longitudinally on the frames, and iron plates placed diagonally outside the wood, but in an opposite direction to that in which the frames are placed. A longitudinal skin of wood is laid outside the diagonal plates, and screwed to the inner skin.

“Fourthly, in constructing ships with the frames or ribs placed diagonally, then a skin of wood diagonally across the frames, with iron plates vertically or longitudinally outside the diagonal wood skin, and an exterior skin of wood screwed to the inner skin.”

[Printed, 10½d. Drawings.]

A.D. 1852, October 1.—N° 116.

DAVIS, WILLIAM BOLIVAR.—This invention consists in making ships' buoys, life buoys, ships' fenders, and other similar articles, of a wicker or cane framework, within which are enclosed cork shavings, water-tight air vessels, and other similar buoyant materials, properly protected from the action of water.

[Printed, 6½d. Drawings.]

A.D. 1852, October 1.—N° 144.

SEATON, WILLIAM.—“Improvements in the construction of  
“ iron vessels, and in sheathing or covering the same.” These  
improvements consist in “a mode of uniting the plates of the  
“ lower sides of the vessel, from the keel to the water line, by  
“ placing the plates edgewise or edge to edge, and fastening them  
“ them with an outer band or strip of metal covering the joint or  
“ seam, and rivetted with bolts.” “I then plank the sides of the  
“ vessel up to the water line with inch ” or inch and a quarter  
planking, “in longitudinal lengths, and of four or five inches in  
“ width; and the planking is to be affixed by means of rivets  
“ countersunk in the wood, and secured by any ordinary means  
“ by rivets through the iron, or by copper rivets, secured by a nut  
“ or screw on the inside of the vessel.” To this planking the  
metal sheathing is secured.

[Printed, 5½d. Drawings.]

A.D. 1852, October 2.—N° 160.

BURCH, JOSEPH.—“Certain improvements in building and  
“ propelling ships and vessels.” These improvements consist,  
firstly, in altering the after parts or buttocks of vessels, in order to  
adapt them to the improved mode of propelling. For this purpose  
the buttock lines are made to converge into a circle of several feet  
in diameter, within a convenient distance of the sternpost, and  
the body or hold of the vessel here terminates in a flat, circular end.  
Between this and the extreme after portion of the bottom, a narrow  
transverse space is left for the propeller, and the after part or tail  
is formed, by continuing the above-mentioned converging lines,  
either to a point, or so that they may “spread flat upon the stern  
“ post in a wedge-like form. This tail is for “lessening the back  
“ water draft,” and it may serve as a magazine.

Secondly, in a new form of vessels “in order to obtain very  
“ high speeds, prevent shipments of the sea, shorten sea voyages,  
“ save time and fuel and sea-going expenses, and other advan-  
“ tages.” The body of the vessel is to be tubular, elliptical, or  
egg-shaped amidships, and to terminate “towards the bows and  
“ stem in a conical point or narrow ellipsis.” The float or load  
water line runs along at about its greatest breadth, the bows and

stem of the vessel diminishing in breadth both above and below this line. A portion of the deck, from the stem to about midships, is to be covered or roofed over, in its form a continuation of the transverse sectional outline, this is for the purpose of preventing shipment of the sea, as well as to afford better accommodation for passengers; a narrow gangway is to run round the covered deck, and terminate above the stem in a grated platform or forecastle. A narrow deck or gallery is also to run along the centre of the roof, terminating in a grated gallery or forecastle in front. The masts are constructed upon the telescope slide principle, so that they may be raised and used in the event of any failure of the machinery, with a strong favourable wind, or to steady the vessel in a rolling sea.

Thirdly, in the construction and use of a new form of propeller, which acts upon the water obliquely, on the screw principle. The body or case of the propeller is flat and circular, corresponding in shape with the propeller space in which it is to be placed; the form of its periphery being a continuation of the buttock or tail lines of the vessel, so that when placed in the propeller space, no part of its surface is exposed to the passing current of water, excepting its narrow periphery. "A surface space" is left between the surfaces on each side of the propeller case, and as the water would fill these spaces, and obstruct the free action of the propeller, it is to be removed by the use of vacuum tubes.

[Printed, 2s. 0d. Drawings.]

A.D. 1852, October 2.—N<sup>o</sup> 176.

ASTLEY, PETER HYDE, and STEPHENS, JOHN FIGGINS.—The invention "consists in or has reference to the construction of floating vessels in such manner as to increase the buoyancy and floating power thereof, and also giving them firm hold upon the water, in order to prevent their being overturned or sunk. The above is effected by the following change in the construction of vessels, namely, instead of the bottom of a vessel being formed in the ordinary manner, the same is to have the form of a hollow conic cavity or of an inverted trough (that is, a trough having its opening at bottom, and towards the water), such trough being most suitable when made to decrease in width from amidship to the stem and stern. The conic cavity to have its base more or less open to the water, and its top should be

“ situated near the middle of the vessel or thereabouts, or several  
“ conic cavities or inverted troughs may be adopted instead of one  
“ for each vessel; and any suitable and known means of exhaust-  
“ ing or compressing the air contained in the conic cavity or  
“ inverted trough when on the water may be adopted in connec-  
“ tion with the invention. By the above arrangements the vessel  
“ will be rendered a much more safe means of transit, more  
“ especially as regards the preservation of human life.”

[Printed, 1s. 1½d. Drawings.]

A.D. 1852, October 2.—Nº 185.

MACCONNELL, JAMES EDWARD.—(*Provisional protection only.*)  
—“ Improvements in sheathing iron vessels, and in covering,  
“ lining, or coating sheets of other manufactured articles of iron  
“ or steel.” This invention relates to the “covering, lining, or  
“ coating sheets, or manufactured articles of iron or steel, with” thin  
sheets “of brass or copper, or an alloy thereof, or of such suitable  
“ metals as may be applicable, for the prevention of the decay,  
“ chemical or otherwise, of the iron or body metal of the surfaces  
“ so protected and covered.” This lining is to be secured by the  
rivets put through the plates in the process of manufacture.

[Printed, 2½d. No drawings.]

A.D. 1852, October 4.—Nº 199.

BATES, EDWIN.—(*Letters Patent void for want of final Specifi-  
cation.*)—“ Certain improvements for deriving motive power from  
“ expansive fluids, and the better application and economy thereof  
“ for propelling ships and other vessels in sea, river, and canal  
“ navigation; also in the shape and action of wind sails. the use  
“ of water as a motive power for driving machines, mills, &c., the  
“ construction of turbines, air and water pumps, marine pumps  
“ for emptying ships of bilge water, and other useful purposes.”  
“ The machine is in effect a propeller; it may be employed to  
“ propel ships; in pumps for raising water; and generally in air  
“ and fluids, where they are required to be lifted, driven, or forced.  
“ I compose the centre of my propeller of a ball or globe or  
“ cylinder, from which radiate one, two, three, or more arms or  
“ blades, so shaped as to throw the water or other medium in  
“ which the propeller acts into and against or around the globe,

" whereby I gain the full propulsive effect due to centrifugal and  
" centripetal forces."

[Printed, &c. 35 drawings.]

A.D. 1852, October 4.—N° 215.

J.ESKINE, JOHN.—"This invention relates to the manufacture  
" of cemented or waterproofed felt, such as is used for ship  
" sheathing and roofing buildings, and other purposes where  
" protective coverings are required. The teasing apparatus as at  
" present in use is in this arrangement combined with the cement-  
" ing apparatus in such manner that both operations are simul-  
" taneously carried on."

[Printed, &c. Drawings.]

A.D. 1852, October 5.—N° 225.

APSEY, JOSEPH.—"Improvements in ship building, and in  
" machinery for propelling." "Firstly, with regard to the con-  
" struction of ships: I make the vessel of such a breadth of beam  
" with regard to her length that a vessel of about 1000 tons  
" burthen shall draw at her stationary load line about eight feet  
" of water; secondly, I incline the bottom of the vessel from  
" amidships or thereabouts gradually upwards to about the load  
" water line at the fore-foot or bows; thirdly, the upper part of  
" the bows are made very much fuller or broader than steam ships  
" are usually built; the most approved form, such as the wave  
" line, may still, however, be retained in that portion of the vessel  
" which is immersed; the object of such a build of vessel is  
" obviously to obtain a greater speed by reducing the resistance  
" of the hull in passing through the fluid in which she floats;  
" and when a high speed be given to such a vessel by the steam  
" power (for I wish to dispense entirely with sails) she will rise  
" and skim upon the surface of the water, drawing less and less  
" as her speed increases, so that the total resistance she expe-  
" riences from the fluid shall not increase in the usual excessive  
" proportion through the submerged cross sectional area of the  
" ship decreasing with the increase of speed."

Secondly, the invention consists "in a peculiar form of screw  
" propeller adapted to the propelling vessels constructed as before  
" described."

Thirdly, in an arrangement “for the purpose of driving the  
“ screws at a much greater speed than it is usual to drive screws,  
“ but without increasing the speed of the steam pistons very  
“ materially.”

[Printed, 10½d. Drawings.]

A.D. 1852, October 6.—N° 268.

CROSSBY, WILLIAM.—(*Provisional protection only.*)—“ Im-  
“ provements in the ventilation of coal pits and mines, ships,  
“ rooms, and buildings generally.” “ To accomplish by the  
“ application of a fan and tubes or pipes the extraction of foul air,  
“ and the substitution of a constant supply of fresh or atmos-  
“ pheric air. The fan is fixed in some convenient position enclosed  
“ in a box communicating only with a pipe for the abstraction of  
“ the foul air, and a hopper or mouth-piece connected with a pipe  
“ for its expulsion. The conduit pipe is connected with the axle  
“ of the fan, which is hollow and perforated, and to it is attached  
“ branch pipes communicating with the various workings, com-  
“ partments, chambers, berths, or rooms proposed to be ventilated;  
“ turn taps to be affixed in proper positions, so that the commu-  
“ nication with any particular working compartment, chamber,  
“ berth, or room, may be cut off or established at pleasure.”  
“ When it is required to inject fresh air, the communication with  
“ the foul air pipes is cut off by means of turn taps,” and another  
set of pipes is called into action. “ Where it may be desirable it is  
“ proposed to employ a double fan, so that at one and the same  
“ time the foul air may be extracted and discharged at any  
“ required distance or place, and a stream of fresh air drawn in  
“ and conveyed to any workings, compartments, chambers, berths,  
“ or rooms desired.”

[Printed, 2½d. No drawings.]

A.D. 1852, October 11.—N° 336.

BARKER, CHARLES MATHEW.—“ This invention has for its  
“ object improvements in saw mills, such as are used for sawing  
“ timber chiefly applicable for ship building; and the improve-  
“ ments consist of combining certain mechanical parts into a ma-  
“ chine for cutting in bevilled, curved, and tapering directions;”  
and also for general, or deal-sawing purposes.

“ The saw frame is mounted on an axis, about which it vibrates

“ to get the desired inclination of cut, in place of causing the  
 “ timber to move on axes, the saw frame being caused to incline  
 “ by the workman during the working. The wood to be cut is  
 “ fixed on a radiating bar or frame, which moves horizontally, so  
 “ as to bring the wood straight or at an angle to the saw or saws  
 “ so as to obtain curved cutting, and one of the saws is moved to  
 “ and fro on its frame by a screw at either end of the saw, which  
 “ screws are put simultaneously in action by the workmen by a  
 “ shaft and bevil wheels, thereby obtaining tapering cuts.”

[Printed, 6½d. Drawings.]

A.D. 1852, October 12.—N<sup>o</sup> 345.

**PERKES, SAMUEL.**—(*Provisional protection only.*)—“ Certain  
 “ improvements in navigable vessels and propellers.” “ I first  
 “ propose to adopt a peculiar shape or form for the hull of boats  
 “ or vessels, in order to give them greater buoyancy, lighter draft,  
 “ and greater area and capacity if required.”

The first plan “ more particularly relates to the shape of the  
 “ lower part of the vessel ; and, taking nature for my guide, I would  
 “ adopt the shape much resembling the submerged part of the  
 “ body of a swan whilst sitting upon the water.” “ I propose to  
 “ fix the paddle wheels, either one or more, towards the stern, in  
 “ about a similar position which nature has assigned for the feet  
 “ of the swan ; or across the breast of the hull, or in the centre,  
 “ so as to give the propelling power where the greatest depth of  
 “ draft exists ; but in any case to chamber out the hull, so far as  
 “ may be practicable, to allow sufficient space for a clear water  
 “ way for the wheels to work in.”

The next plan proposed is to construct, either of plain or corru-  
 gated iron, “ one or more pontoons or other hollow vessels, either  
 “ longitudinally or transversely, and construct a platform thereon  
 “ for the bottom of vessel, and when applied longitudinally, I  
 “ propose to place the paddle wheel or wheels between them. The  
 “ decks I first propose to construct of two or more thicknesses of  
 “ timbers, with their fibres laid in opposite directions, either at  
 “ angles or right angles, as required, and well bedded together  
 “ with pitch, asphaltum, oakum, marine glue, white or red lead,  
 “ or other plastic material.” It is also proposed to construct  
 timber vessels on principles “ invented by me and claimed  
 “ under Protection of Inventions Act, 1851, for my provisionally

“ registered mode of constructing beams for bridges, buildings, keels, masts, &c.,” by which means an entire vessel—hull, decks, beams, diagonal braces, &c. &c., is to be constructed from stem to stern, as of one entire and solid mass, the whole body being composed of “ laminated thicknesses set edgeways, and the fibres crossed at every possible angle and direction.”

“ I also propose to construct certain vessels” “ on the laminated principle, in water-tight compartments, which such mode of constructing will admit of, altho’ in timber; also to use iron for such water-tight bulkheads if ” preferred.

It is proposed further, to construct an interior shell entirely of iron, “ which will be found very valuable for vessels of war,” &c. “ I also claim for the application of gutta percha or vulcanised india-rubber, or both combined, for a water-tight bedding and caulking for timbers, &c. on board, and in the construction of the foregoing and ordinary vessels.”

“ The next arrangement I propose is, for the application of certain kinds of sails, which I would compose of metals or wood or other suitable material, on the principle of jealousies or Venetian shade blinds.” “ I also apply windmill sails, in certain cases and of certain descriptions,” as an auxiliary power for driving propelling wheels, &c. in certain situations.”

“ I also propose to enamel or vitrify iron or copper, or other material, and use the same, or plain copper sheathing metal only, for external sheathing, and bed the entire in gutta percha, or pitch, or other suitable matter, whilst in a plastic state.”

The next improvement is in “ the construction of the paddle wheel or wheels which I employ for propelling where mechanical power is used.”

“ I also propose to use the smoke from steam vessels, and convert the same into gas, and light up vessels with the same in certain cases where required, or use other materials for generating and using gas on board ships or sailing vessels for lighting and cooking and other useful purposes, instead of ordinary fires and candles. Also I employ warm water or steam pipes for the purpose of warming the apartments, &c., instead of fires. Also, I claim the manufacture & application of gas on board sailing vessels, and the use of the same thereon.”

[Printed, 3½d. Drawings.]

A.D. 1852, October 15.—N° 393.

**BURRILL, JOSEPH** —“Improvements in building ships and vessels  
 “for the purpose of saving lives and property in cases of ship-  
 “wreck or fire at sea.” The invention “consists in constructing  
 “vessels in two distinct parts, but having the appearance, when  
 “together, of a perfect vessel; the larger part to be the great  
 “body of the ship, containing the whole length of keel, main and  
 “fore masts, hold, space for machinery, stowage, &c., and which,  
 “for the sake of distinction, I shall call the parent or principal  
 “part, the lesser or escape part to contain the berths, saloons,  
 “victualling stores, treasury, &c. The escape part, to have the  
 “form of and to be a perfect vessel of itself, is to carry the mizen  
 “mast, and is to occupy the space of, and to be a substitute for,  
 “the quarter and after decks of the perfect vessel, running from  
 “the stern up to about the main mast, and down to or level about  
 “with the water line, and so arranged and fixed upon the parent  
 “part of the vessel that in cases of shipwreck or fire it may with  
 “ease be launched off the stern of the” principal “or parent  
 “body of the ship.” “To facilitate the launching, I propose that  
 “the parent part of the vessel should be divided by one or more  
 “water-tight bulkheads, having in the stern division water-plugs,  
 “which in cases of wreck or fire, and when all hope of saving the  
 “perfect vessel is lost, are to be drawn; the after part of the  
 “parent vessel will immediately fill with water and sink, and the  
 “escape part” “will easily, when loosened from her fastenings,  
 “float off the wreck.”

{Printed, &amp;c. Drawings.}

A.D. 1852, October 18.—N° 422.

**TOWELL, GEORGE RANDFIELD, and MANN, JOHN, junr.** —  
 “Improvements in the construction of ships and other vessels.”  
 This invention consists in building vessels of a semi-circular  
 form in their transverse section. “The circular form given to the  
 “ribs or timbers of vessels by this mode of building will greatly  
 “increase their strength; and the uniformity of the water line,  
 “whether the ship be upright or heeling over under a press of  
 “canvas, will, it is expected, greatly increase her speed. The  
 “form is also well adapted for a steam ship, as the greater the

“ velocity with which such a vessel is propelled through the  
 “ water, the more readily it will lift itself above the waves, dis-  
 “ placing less water, and thus causing less resistance.” To  
 obviate the tendency which a ship of the ordinary construction  
 has to “hogging,” an inverted arch form is given to the dead  
 wood of these vessels, and the entire framework and keel are  
 well bound together. Additional strength and security are also  
 given to the stem of the ship, by filling in the hull inside the  
 stem with a water-tight bulk-head of solid timber. Beyond  
 the stern post, the timbers and deck may be carried out to any  
 extent desired, to form an overhanging stern; and should this  
 portion of the ship be carried away by collision or the force of the  
 waves, a strong partition is fitted to preserve the vessel from  
 further damage by the ingress of water. To add to the strength  
 of the upper part of the hull; on the inner side of the frames, and  
 level with the deck, strong double waterways of oak are carried  
 round the vessel, and firmly bolted to the ribs and beams, and to  
 these the bulwarks are secured. Double keels may in some cases  
 be employed.

[Printed, 8½d. Drawings.]

A.D. 1852, October 18.—N° 433.

McLEOD, JOHN LYONS.—(*Provisional protection only.*)—“ Im-  
 “ provements in giving a metallic coating to iron ships’ bottoms  
 “ and other surfaces.” The invention consists in “ a method of  
 “ covering metals, wood, or other materials with thin plates,  
 “ sheets, or leaves of any metal required for that purpose, by  
 “ attaching them with marine glue or any varnish, cement, or  
 “ similar adhesive matter.”

[Printed, 2½d. No drawings.]

A.D. 1852, October 21.—N° 471.

PROVIS, JOHN.—(*Provisional protection only.*)—“ Improve-  
 “ ments in the construction of ships or vessels.” The improve-  
 ments relate,

Firstly, to an improved mode of constructing the hull of a ship.  
 “ The ship is widened and lengthened, and its depth lessened, and  
 “ by this means the lower part of the ship is raised from deep  
 “ water (where there is the greatest resistance to motion) to the

" top water, where there is the least;" by this means a better  
" security for goods and a greater stability and sailing power for  
" the ship " are obtained.

Secondly, to the construction of the keel of the ship " of cast  
" iron, in three pieces, thin, and of great depth, say, for a vessel  
" of 1,000 tons, five feet deep "

Thirdly, " to a mode of strengthening ships or vessels by em-  
" ploying a tubular truss division in the centre of the ship; this  
" tubular truss is fixed on the keel, into which are fixed five iron  
" masts, " and connected with which would be the deep heavy  
" keel, the floors, and beams of the vessel, and by this applica-  
" tion of power, like the vertebræ of an animal, a greater  
" strength is given to the ship than any ship ever before  
" possessed."

Fourthly, " to building the hull of the new ship with wood and  
" iron combined, the latter being applied in the form of thin plates  
" placed on edge to form the framework of the vessel, instead of  
" the present frame timber and futtocks of wood. For a vessel of  
" 1,000 tons these plates should be about nine inches in depth, and  
" five-eighths or three quarters in thickness, these plates constitute  
" the strength of the floor and sides of the ship, and the spaces  
" betwixt the plates are filled in with wood of any description or  
" length; the ship is then to be planked with oak outside and  
" inside, and these planks are held together with iron screw pins.  
" The inside planks should be fixed diagonally, and will then  
" form a kind of truss; the iron screw pins are passed through  
" both planks. If the same principle of construction is to be  
" applied to construct a ship wholly of iron, then the plates must  
" be corrugated, and the ribs and floors made of tubular iron."

Fifthly, to a method of breaking the force of the waves " by  
" giving an acute angle to the upper works of the ship; by so  
" doing the wave would be cut in two, a part being thrown over  
" the canvas covering of the upper deck of the ship," and the  
other part carried under the vessel. It is also proposed to enclose  
a false keel, or a number of small keels, between the plates which  
form the fixed keel, which false keels may be lowered down as  
required.

[Printed, 2½d. No drawings.]

A.D. 1852, October 21.—N° 479.

**ADDISON, WILLIAM.**—(*Provisional protection only.*)—" This  
" invention consists of forming vessels with recesses on either side  
" at or about midships. The forward part of each of such recesses  
" being struck from the centre of the axis of the " propellers,  
" each of which consists of a portion (about half) of a cylinder,  
" the diameter of which is such as to lie within its recess; the  
" curved portion of the propeller being forward, and the flat portion  
" aft, so that, when caused to oscillate each propeller acts as a  
" constant oar. The parts being also arranged so as to reverse the  
" action."

[Printed, 2½d. No drawings.]

A.D. 1852, October 23.—N° 499.

**BRODIE, JAMES.**—" Certain improvements in the construction  
" of sea-going vessels." The invention consists, firstly, " in  
" employing two or more vessels joined together at the side, but  
" placed at such a distance from each other as will secure their  
" stability as floating bodies, and allow the water they displace to  
" pass freely between them. A space equal to at least the breadth  
" of one of these vessels will be necessary for these purposes. One  
" or more of these vessels must be of such a size and form as to  
" contain the crew by which they are navigated, with such portion  
" of the cargo to be carried as may be desirable, while one or more  
" may be of smaller dimensions, and be principally designed to  
" serve the purpose of giving stability to the others. The vessels  
" are connected together by means of spars or beams of wood or  
" rods or bars of iron." "The space between these vessels may  
" be either left open or covered with a netting, or, if preferred, a  
" deck or platform of wood may be formed thereon."

Secondly, " in building vessels of such a form as to avoid the  
" ordinary curvature of the sides and bottom of the vessel, and to  
" substitute in lieu thereof a formation of the sides and bottom  
" relatively disposed in such a manner as to form an angle the  
" one with the other, that is to say, the bottom being flat or  
" nearly flat, and the sides rising from it in a straight line or  
" nearly so." Both stem and stern are to be sharp.

Thirdly, " in adapting and applying to vessels, whether of the  
" form above described or of other forms, a moveable stem or cut-

“ water, in place of the ordinary fixed stem or cutwater. It is  
 “ fitted to the fore part or bows of the vessel in such a manner as  
 “ to admit of its being raised out of its place, and lowered down  
 “ into it again, as occasion may require.” “ One mode of accom-  
 “ plishing this object may be by forming the back of the cutwater  
 “ hollow, and fitted to the part of the vessel against which it is  
 “ placed, and uniting them by means of screws or bolts.”

[Printed, 54d. Drawings.]

A.D. 1852, October 23.—N<sup>o</sup> 505.

MACBAY, WILLIAM.—“ Improvements in extinguishing fire in  
 “ dwellings, factories, and other buildings, and in ships.” For  
 the purpose of extinguishing fire on ship board, pipes of a suitable  
 diameter, say an inch or more, are to be laid down along the sides  
 or in front of the “ shelf,” as it is technically called, between the  
 decks; and from end to end, under the centre of the decks, or on  
 each side of the fore and aft carling, having a communication on  
 each side of the vessel with a force pump, that the pipes may be  
 charged from the sea or tank. “ These pipes with perforated  
 “ projecting nozzles at suitable distances, say a foot and a half or  
 “ more, are fitted with caps or covers of gutta percha or fusible  
 “ metal.” The sea connection with the pump and pipes is always  
 to be left prepared, so that in the event of fire appearing in the  
 hold or other part of the vessel it will only be necessary to apply  
 the pump at once, when the fire acting upon the gutta percha or  
 fusible metal, will cause the whole force of water to be directed to  
 the locality of the fire. “ In steam vessels steam may be forced  
 “ through these pipes instead of water, when fusible metal caps  
 “ will be used over the nozzles, or carbonic acid gas, if a generator  
 “ of that gas is on board, may be applied in any vessel, a connec-  
 “ tion by union joint plug being constructed on any deck most  
 “ convenient for the purpose.”

[Printed, 34d. No drawings.]

A.D. 1852, October 27.—N<sup>o</sup> 545.

NORMAND, CHARLES BENJAMIN.—“ Improvements in ma-  
 “ chinery for sawing wood.” These improvements consist in an  
 arrangement for moving the pieces of timber to be cut, in variable  
 arcs of a circle tangential to the fixed saws, which is effected on  
 rough trees, by means of carriages provided with pivoting wheels

or pairs of wheels, which are capable of moving round fixed centres, and thereby directing the carriage to which they are connected, and on which the log of timber to be cut is mounted. In “operating on timber already sided,” it is caused “to travel on a set or sets of rollers so arranged as always to converge to the centre of motion required, and which may be inclined all at once when it is required to cut the timber to a bevel.”

In the methods of causing the saw blades to travel laterally, so as to cut at once both sides of timbers, which may thereby be made to vary in thickness throughout. Thus “the extremities of the adjustable blade are carried by blocks which work respectively in guides, and move simultaneously by screws connected together. A ratchet, catching at each end of a stroke one or more teeth of a wheel set on one of the screws, causes this screw and the other connected with it to change the position of the saw blade in the required direction and extent;” or, according to another arrangement, the saw is moved laterally by means of a lever connected with it, which can be raised or lowered by causing it to strike against an adjustable pin.

In supporting logs of timber on angular edges or  $\Lambda$  guides, along which they may be drawn in any convenient way to the saws; and in supporting the log on three short wood screws, screwed into the under side of the log, the heads of the screws resting on the smooth and straight floor. The saws move in horizontal planes, and the feed motion is given by vertical fluted rollers, which are placed on each side of the saws, and against which the piece of timber is made to bear by compressing rollers, kept in contact with the log by weights.

Also in machinery “for shaping the ends of pieces of timber in two series of parallel planes meeting at acute angles for the purpose of making scarfings, which, when glued together, will form joints of considerable strength.”

[Printed, 1s. 2½d. Drawings.]

A.D. 1852, October 28.—N<sup>o</sup> 557.

MALLET, ROBERT.—“Improvements in fire-proof and other buildings and structures.” “I employ wrought-iron plates of a square or rectangular form, and I stamp them, or hammer or otherwise shape them, so as to curve them in both transverse directions. A very stiff plate is thus obtained, which is not the

“ case if the plate is curved in one direction only. The edge of  
 “ the plate may be left flat or curved, or bent to a different angle  
 “ or curve to that of the rest of the plate. Such plates may also  
 “ be cast of the required form, and may also be made polygonal  
 “ or triangular, instead of rectangular. These plates may also  
 “ be made of fire-clay or earthenware, or pottery, or of glass  
 “ when transparency is required for roofs, or dead lights, or  
 “ similar purposes, or they may be made of any other suitable  
 “ material. The plate may be made of one piece, or of several  
 “ pieces rivetted or otherwise joined together.” These plates,  
 which may be called “ buckled plates,” are employed in various  
 ways in the construction of floors, bridges, &c.

“ Rectangular or polygonal tanks, fire-proof safes and boxes,  
 “ and other vessels, partitions, shutters, doors, bulkheads, ships’  
 “ magazines, and other structures, may be made of the buckled  
 “ plates, rivetted or otherwise united together with angle iron,  
 “ or T or I iron. The intervals may be filled with water, or  
 “ substances containing water, or non-conducting substances,  
 “ when required to resist the spread of fire. In a similar manner  
 “ the buckled plates are applicable to walls, coffer dams, and  
 “ sheet piling, the plates being fixed between wrought iron or  
 “ other piles.”

[Printed, 9½d. Drawings.]

A.D. 1852, November 2.—Nº 612.

**DIBLE, JAMES.**—The invention consists in the application of  
 pipes or chambers, to any part of either steam or sailing vessels,  
 for the supply of pure and fresh air, in combination with other  
 pipes or chambers for carrying away the impure and foul air,  
 the draft being regulated by dampers, and by revolving ventilators  
 or plates, in the cabin floors, &c. It is also applicable for supply-  
 ing warm air to the interior of vessels through such pipes or  
 chambers, and for extinguishing fires on board, by admitting water  
 through the same pipes or chambers as are used for the supply of  
 air.

[Printed, 6½d. Drawings.]

A.D. 1852, November 3.—Nº 632.

**HODGE, NEREMIAH.**—This invention consists in a combina-  
 tion or system of two series of chambers, connecting pipes, dis-

charging pipe, receiving hole or orifice, and ventilating pipes, so arranged within the hold of a ship or navigable vessel, that by the rolling or pitching movements of the vessel when at sea, they will be made to raise water from the hold, and discharge it on the deck of the vessel, or into the sea. "The chambers of each series are  
" arranged one above the other, and one series is placed in one  
" part of the hold, while those of the other series are disposed in  
" an opposite part thereof; that is to say, one may be placed near  
" the bow, while the other may be placed near the stern. Through  
" the upper part of the side of the lowest chamber of each of the  
" series one or more openings are made, and from out of the  
" lower part of the said chamber a pipe is carried and made to  
" extend to and open into the upper part of that chamber  
" of the other series, which has its bottom arranged on a  
" level with the top of the first-named chamber of the first  
" series. Each chamber of each of the said two series is to be  
" similarly connected with that chamber (of the other series)  
" which is placed next above its level, and this by a pipe leading  
" out of the first chamber at or near its bottom, and into the  
" second chamber at or near its top. Each of the upper chambers  
" of the two series has a pipe leading out of it near its bottom  
" and towards the opposite series of chambers, and carried upward  
" above the said series of chambers. To the upper end of the said  
" pipe a discharging mouth is applied. Each chamber has one  
" or more ventilating pipes applied to it so as to open out of its  
" upper part, and rise and open above it nearly or quite on a  
" level with the top of the chamber next above it." "If each  
" tube that connects a chamber of one series with a higher one  
" of the other, instead of being made to enter into the upper part  
" of the highest chamber of the two, is made to enter into the lower  
" part of the said higher chamber, and is provided with a valve  
" opening into the chamber, the apparatus will operate when under  
" very slight rolling or pitching of the vessel."

[Printed, 6½d. Drawings.]

A.D. 1852, November 4.—Nº 637.

POPE, WILLIAM.—The object of this invention is to effect a continuous circulation of air between the decks of steam and sailing vessels, and through the several cabins and other compartments of such vessels, without the aid of fans or other apparatus

driven by steam or other motive power. "At the head and stern  
 " of the vessel I provide a series of air conductors, and I bring  
 " into connection therewith a system of pipes which traverse the  
 " vessel in any convenient way, and give off the air supplied to  
 " them wherever it is required. Thus, for example, in ventilating  
 " a passenger ship I fit in the floor of each sleeping cabin a  
 " metallic or other box having a lid pierced with numerous  
 " holes, or covered with a grating, and I connect this box with  
 " the system of ventilating pipes. A current of air being set up  
 " in these pipes by the rapid progress of the vessel through the  
 " atmosphere, a continuous stream of fresh air may be supplied  
 " to each sleeping berth during the whole progress of the  
 " voyage." Escape passages for vitiated air may be made as  
 required.

"I find it convenient in steam vessels to connect the system  
 " of ventilating tubes with the steam boiler furnace, for by that  
 " means I not only cause a more rapid circulation of air through  
 " the pipes than can be obtained by the passage of the vessel  
 " through the atmosphere or by the action of the wind, but I am  
 " enabled at all times to feed the furnace fires with the required  
 " amount of air, even when, as in a storm, the hatchways are  
 " closed."

"In order to ventilate ships which are fitted for carrying  
 " cattle I provide conductors for air at the sides, in lieu of or  
 " in conjunction with the head and stern air conductors above  
 " described, and these side conductors I so construct that they  
 " may be made to meet the air as the vessel proceeds in its  
 " course, and thereby set up a circulation of fresh air within  
 " the vessel." Each of these side conductors consists of a  
 hinged door, which carries a bull's-eye for the admission of light,  
 and a screen of wire gauze or perforated metal set at an angle to  
 the door, and secured thereto by segment pieces. When the con-  
 ductors are open, and the vessel is in progress, they will collect  
 air, and pass it through the screen. In stormy weather these  
 conductors may be closed like the port-holes of a ship.

[Printed, 1s. 6d. Drawings.]

A.D. 1852, November 5.—N<sup>o</sup> 656.

**DUNDONALD, THE EARL OF.**—"Improving bituminous sub-  
 " stances, thereby rendering them available for purposes to which

“ they never heretofore have been successfully applied.” The  
“ improvements consist in treating such substances, whether  
“ natural bitumen or artificial pitch, in such manner that they  
“ shall retain or acquire the properties of plasticity, cohesion, and  
“ flexibility, adapting them as substitutes for the bitumen of  
“ Trinidad and New Brunswick,” in the matters referred to in  
Letters Patent, N° 13,698.

“ My most improved proceedings whereby to restore or impart  
“ elasticity to these substances, especially to artificial bitumens,  
“ consists in counteracting or avoiding the injurious effects of  
“ carbonization produced in the formation of pitch by intense heat  
“ employed to expel the last portion of naptha in the process of  
“ distillation. With this view, previous to remelting the bitumen  
“ or pitch, I bruise or pound the material, in order to expose as  
“ much surface as possible to the influence of gentle heat, and  
“ also to facilitate the combination and operation of solvents there-  
“ on, such as tar, petroleum, naptha, and the like; the mixture is  
“ then to be melted in appropriate vessels, preferring heat by  
“ steam or water baths, which sufficiently liquify the amalgam, and  
“ enable it, by stirring, to become of a uniformly plastic con-  
“ sistence.”

The properties of cohesion, tenacity, and flexibility, thus in a degree restored or imparted, may be further increased by the addition of filamentous materials, such as refuse wool, cotton, tow, the scrapings of hair from hides, and other slender staminae, blended and combined by stirring.

With the oil of petroleum as a solvent, the bottoms of ships and vessels may be encased in an impermeable, durable, elastic coating, to which copper sheathing will closely adhere, as if the bottom of the vessel, the coating, and the copper, were one solid material. The interstices between the floor timbers of ships and vessels may also be filled up (to the exclusion of bilge water), whereby the frame will be united, as if formed of a single block, and the vessel rendered healthy.

[Printed, 3½d. No drawings.]

A.D. 1852, November 13.—N° 739.

HAWKESWORTH, AMORY.—This invention consists in constructing a life boat “with air chambers on either side, the air  
“ chambers on one side being completely closed so as to prevent

“ water getting in to displace the air, whilst the air chamber or  
 “ chambers on the other side of the boat is or are open below, such  
 “ open chambers having pipes descending to near the bottom  
 “ thereof, down which air descends into the chamber or chambers  
 “ to displace the water when the boat is righting itself; by which  
 “ arrangement (combined with the ballast to overcome the buoy-  
 “ ancy of one side) the boat, if turned over, will right itself by  
 “ reason of the water flowing into and filling the air chamber on  
 “ one side only, leaving the buoyancy of the other, aided by the  
 “ ballast, to act to right the boat; and in order to get rid of any  
 “ water which may from time to time be shipped, valves opening  
 “ downwards are used which prevent the water flowing into the  
 “ boat from below; but on shipping water the valves will open  
 “ and the water will flow away down to the water line outside, and  
 “ the pump will remove the remainder.”

[Printed, 54d. Drawings.]

A.D. 1852, November 22.—N<sup>o</sup> 810.

BATES, EDWIN.—(*Provisional protection only.*)—The inventor says that, by a greater knowledge of geometry, probably, than ever one man before possessed, he defines positively the outlines of the best life boat, as follows:—

“ 1st plan. I draw a line to represent a diameter and a semicircle  
 “ with radius of half of it, within which, and with  $\frac{2}{3}$  of the former  
 “ radius, I describe another, and upon it I mark the points of the  
 “ sexagon” [hexagon?], “ and from those two points I draw (with  
 “ the same radius), lines to join the two semicircles. The four  
 “ lines described form a section of the boat as it would appear if  
 “ cut across.

“ 2nd plan. I describe a circle, and draw a vertical diameter and  
 “ equilateral triangle: in the third quarter from the lower end of  
 “ this diameter I place the compasses and describe a semicircle  
 “ with radius of half one side of the triangle. The  $\frac{2}{3}$  of the cir-  
 “ cumference of the large circle and half that of the inner one form  
 “ the two bottoms of the boat. Again, I draw a circle, and with  
 “ the same radius I fix the compasses on the circumference, and  
 “ describe another circle, and what may be termed the moon in  
 “ this figure forms the two bottoms.

“ 3rd plan. I draw a line of the proposed width of the boat: I  
 “ extend a perpendicular downward to the extent of one fourth

“ of it, and I describe an arc to pass through this point and each  
 “ end of the line, from the quarters of which I describe quadrants ;  
 “ these three lines form the exterior, and the interior bottom is a  
 “ semicircle of the same radius joining the two quadrants and the  
 “ centre of the first line.

“ 4th plan. When merely a small and light boat, I construct it  
 “ in the form of an egg, but of the same lines as already described.  
 “ The balance for such a boat is a ball suspended in the water by  
 “ a chain from the centre of the bottom to act with a short keel.

“ In other cases, the righting power is effected by means of a  
 “ tube or cradle, placed between the two bottoms, with a ball or  
 “ balls, roller or rollers, or quicksilver, to oscillate from the ex-  
 “ tremities of the side of the equilateral triangle, which may be  
 “ extended to the extremities of the horizontal diameter of the large  
 “ circle when the boat is the entire cylinder. These weights have  
 “ a transverse action, and always assist the ordinary keel, but are  
 “ of the greatest importance when the boat is keel up, giving the  
 “ balance in the direction where it is required.”

[Printed, 2½d. No drawings.]

A.D. 1852, November 24.—Nº 855.

GLOVER, ROBERT MORTIMER.—“ Improvements in coating  
 “ the bottoms and other parts of ships and vessels, in order to  
 “ prevent animal and vegetable growth in contact therewith.”  
 The invention consists in preparing paints or varnishes applicable  
 to the coating of the bottoms and other parts of ships and vessels,  
 by employing arsenite or arseniate of lead, with or without the  
 addition of the red or yellow sulphurets of arsenic. The inventor  
 prefers to use, for mixing with the arsenite or arseniate of lead,  
 the arsenite of copper, and the red and yellow sulphurets of  
 arsenic, commonly called realgar and orpiment, and in the following  
 proportions :—two parts by weight of arsenite or arseniate of lead,  
 one part of realgar, one of orpiment, and one of arsenite of copper.

[Printed, 2½d. No drawings.]

A.D. 1852, November 26.—Nº 871.

TAYLOR, JAMES.—“ Certain improvements in and applicable to  
 “ floating graving docks, for repairing and building ships.”  
 The invention “ has for its object the construction of such docks  
 “ and the arrangement of the apparatus belonging thereto, in

" such a manner as to adapt them for use, independently of the  
" rise and fall of tides." This is to be effected " in the first place,  
" by constructing floating graving docks of iron in compartments  
" from which the water may be discharged, and in which its  
" height may be regulated according to an index in the engine  
" room or other convenient place." These docks are closed by  
means of iron gates, or of a caisson at the stern, worked by crab  
winches and chains. The engines and pumps for discharging the  
water, are fixed at the head or sides of the dock, and communicate  
with the compartments by means of pipes. To the body of the  
dock, on each side, are adapted and applied hollow spaces or  
chambers with partitions in them, into which spaces or chambers  
the water may pass from the body of the dock, through valves  
worked from the upper part of the same.

Secondly, " by adapting to or raising upon ship lifts or rafts,  
" hollow air-tight side walls, thereby forming such lifts or rafts  
" into floating graving docks."

[Printed, 1s. 0½d. Drawings.]

A.D. 1852, November 26.—Nº 884.

FEATHER, ROBERT BARNARD.—"Improvements in the con-  
" struction of ships, and in rendering ships and boats impervious  
" to shot." "This invention has reference to the construction of  
" ships, and to the padding of ships and boats, whether composed  
" wholly of metal, or of metal and wood combined, or of wood  
" alone, for the purpose of effecting an economy in the building  
" of vessels, and adding to their strength, and also securing them  
" against the injury arising from cannon shot, and from leakage." The bottom, or lower part of the frame and hull of the vessel, is  
to be constructed of timber to about one-half of the perpendicular  
height of the vessel, exclusive of the bulwarks or topsides. From  
that height upwards, the vessel is to be constructed of iron. For  
this purpose sheets or plates of iron are raised upon iron stan-  
chions or ribs made sufficiently strong, and stepping upon and  
clasping with an inner and outer leg, the timber heads, main  
wales, and ceilings, forming the lower part of the hull. The  
inner leg extends downwards to the keel, and the outer one  
as low as necessary, and both are firmly bolted through the  
bottom. The main vertical timbers of the ship or vessel, are  
carried up to the full height required, at equal distances of 10 or

12 feet apart. "These timbers are lined inside the vessel with  
" pieces of wood throughout their whole length, so as to make  
" them thick enough to form compartments" of 10 or 12 feet  
" each, to receive the linings or paddings." The intervening  
spaces between the ceilings and the wales, are to be filled in solid,  
to a sufficient depth to receive the bolts and fastenings of the  
iron ribs or stanchions, the upper portion of the main wales being  
laid diagonally either way, with a view to increased strength.  
The exterior iron plating of the vessel is to be covered and pro-  
tected with good and well prepared hides or sheets of caoutchouc  
or india-rubber, attached by marine glue, and pinned through the  
metal at certain distances, and clenched within board. Each of  
the internal compartments to be lined and filled in with any  
given multiplied thickness of the same material as the outside,  
glued or pinned together, and secured with transverse iron bars.  
The hold and deck beams may be constructed either of timber or  
iron, and all the decks, below the upper or quarter deck, are to be  
laid with iron instead of wood. The decks will then consist of  
sheets or plates laid with butt or lapped joints, which are to be  
secured to the beams, and additionally supported by means of  
zig-zag or other shaped iron frames let in between, and fastened  
to the several beams. To render ships and vessels more imper-  
vious to the effects of cannon shot, "I make use of such materials  
" as are considered to possess the qualities of toughness and  
" durability, and which, when firmly fixed and secured, will offer  
" considerable resistance, so as not to yield under ordinary cir-  
" cumstances, nor be subject to splinter or take fire. With these  
" objects in view, it is proposed that the whole interior surface of  
" the vessel, or parts exposed to injury, be lined throughout with  
" sufficient and proportionate thickness, of the following materials,  
" in a series of three linings or casings, placed one over or upon  
" the other." The first lining to consist of a number of thick-  
nesses of stout well-tanned hides, held together and kept in their  
places by marine glue, or by spikes driven through them at  
sufficient distances, and secured in their respective compartments  
by two stout transverse wrought iron bars; the second of a series  
of broad sheets of caoutchouc or india-rubber, glued or spiked  
together as the foregoing, and secured by two strong horizontal  
wrought iron bars; and the third of broad sheets of good sound  
cork, glued or spiked together as before. "These various thick-

" nesses of padding are to be entirely covered over or cased with  
 " zinc, yellow metal, or copper, formed into sheets of sufficient  
 " size to enclose or extend over each compartment of every"  
 10 or 12 " feet, with a return edge, which is to be secured to the  
 " receiving plates, the said sheets being also spiked to the linings."  
 The whole to be finally secured by two strong perpendicular wrought  
 iron bars, spiked to the lining, and with long return ends bolted  
 to the vessel's beams, and to the decks above and below.

[Printed, 94d. Drawings.]

A.D. 1852, November 27.—N° 892.

WOODALL, DANIEL.—These improvements consist, " firstly, in  
 " combining wood and iron in building canal boats, in such  
 " manner that, whilst I retain the strength and rigidity of the  
 " iron in those parts requiring the same, I obtain also the  
 " buoyancy of wood, causing the boat so constructed to float  
 " lighter in the water."

" Secondly, my invention consists in an improvement in securing  
 " the iron to the wood."

The mode of proceeding is as follows :—The bottom of the boat  
 is formed of elm or other wood of the usual thickness, and having  
 the usual scantling of keelson, and all round the edge of this  
 bottom, on the inside, angle iron of any suitable size is secured.  
 This having been properly bolted or otherwise secured to the  
 bottom, iron plates are rivetted to the upright flange, to form the  
 sides and ends of the boat; the boat is then capped all round with  
 angle iron, one side of the angle iron being rivetted to the inside  
 of the plates forming the sides and ends of the boat, and the  
 other side projecting into the boat, and forming a ledge of about  
 three inches in width all round the top.

[Printed, 24d. No drawings.]

A.D. 1852, November 27.—N° 896.

GILMORE, JOHN.—(*Provisional protection only.*)—" An im-  
 " proved mode or means of extinguishing fire in ships or other  
 " vessels " By this invention, supply pipes of cast iron or other  
 suitable material, are fitted under the beams, on each side of the  
 vessel, extending from the stem to the stern, and branch pipes lead  
 from these to the hatchways and other parts of the ship. The

supply pipes communicate with cisterns, one at the head and the other at the stern of the vessel, which are fed by pumps.

In order to send a supply of water to the hold of the vessel, where fire frequently occurs, valves are placed at suitable distances in the deck, which may be opened or shut at pleasure; from the cross pipes, water will flow down these valve holes in great quantities, and in those parts only where the fire may be raging, as the direction of the water may be regulated by stop-cocks.

[Printed, 5½d. Drawings.]

A.D. 1852, December 2.—Nº 937.

POULSON, EBENEZER.—“An improved mechanical purchase, “applicable to working ships’ and other pumps, and to similar “purposes.” “This invention consists in a peculiar adaptation “of lever for working ship and other pumps, and may be employed “as a mechanical purchase when required.” The lever is T-shaped, and is suspended between fixed bearings, on standards, at the point where the two lines of the T cross each other; one of these lines being vertical and the other horizontal. In working pumps by this arrangement, the rods of the plungers are fitted to the two extremities of the horizontal portion of the lever. By swinging or oscillating the vertical portion of the lever, which is weighted at the lower end, the horizontal portion will receive a vibratory movement similar to that of an ordinary steam engine beam.

[Printed, 5½d. Drawings.]

A.D. 1852, December 3.—Nº 951.

WALL, ARTHUR.—(*Letters Patent void for want of final Specification.*)—“Improvements in preparing sheet metal for ship-building “and other uses.” These improvements consist in “the applica- “tion of mercury, or solutions of mercury, and arsenic to metals, “either for building iron ships, or ships’ sheathing, and other “uses, whether copper, tin, zinc, or a compound of these metals.”

[Printed, 2½d. No drawings.]

A.D. 1852, December 21.—Nº 1121.

BEADON, GEORGE.—“Improvements in constructing and pro- “pelling ships and vessels.” “The vessel is to be constructed “with an under-water bow of a conical form, to which I apply a

" screw or such like propeller; and the stern of the vessel I  
 " construct in such manner that the propeller axis and part of  
 " the vessel may assume an angle to the keel, and admit of the  
 " propeller being used to propel, or propel and steer; and when  
 " sailing the propeller may be simply used as a rudder."

[Printed, 1s. 6½d. Drawings.]

A.D. 1852, December 29.—N<sup>o</sup> 1194.

COOK, JAMES EDGAR.—A new composition for coating the bottoms of iron or wooden vessels, as well as other surfaces exposed to fouling, oxidation, and decay. The following matters enter into this composition: gum shellac, gum seedlac, gum gamboge, gum arabic, gum benzoin, red lead, white oxide of zinc, and French verdigris, dissolved in spirit of wine of a strength of sixty per cent. over proof. The proportions are, two pounds of shellac, half a pound of seedlac, half a pound of gamboge, half a pound of gum arabic, half a pound of gum benzoin, one pound of red lead, one gallon of spirit of wine. This composition is brushed on the surface as a first coating; then, for the second coating, the same composition has added to it, one pound and a half of white oxide of zinc, and one pound and a half of French verdigris.

[Printed, 2½d. No drawings.]

A.D. 1852, December 30.—N<sup>o</sup> 1206.

TAYLERSON, ROBERT.—"Improvements in building ships of iron." Instead of having all the ribs vertical and parallel, some of the ribs are vertical and parallel, and others, combined therewith, are diagonal. The plates used for plating such vessels, are cut with diagonal instead of square ends. In order that the doubling or connecting pieces, may offer equal strength in all directions, the plates from which they are made are rolled in opposite directions. The keel and keelson are each constructed of two trough irons, face to face, connected on the upper and under sides by plates and rivets. The water-tight bulkheads, instead of being fixed to the ribs as heretofore, are fixed to T-iron, such T-iron having on either side strong timbers, which are fixed to the T-iron and plates, by screw bolts (and nuts) passing through them; and the deck beams, instead of crossing at right angles, cross diagonally, and they also cross each other.

[Printed, 10½d. Drawings.]

1853.

A.D. 1853, January 6.—N° 33.

**BROWNE, JOHN.**—(*Provisional protection only.*)—The object of this invention is to obtain, by means of certain forms or lines of construction and mechanical arrangements applied to vessels generally, whether using wind or steam as a motive power, increased rapidity of motion through the water; also by propellers of a new construction to obtain a similar result, and consequent economy of fuel. The ship or vessel is to be flat bottomed, or nearly so, and is to have deep iron keels, called “yielding keels,” as they yield to pressure from below, and when they meet with any resistance, rise into a casing formed in the hold to receive them, falling again as the draught of water deepens. They are also capable of being trussed up on entering shallow water. The rig is to be of smaller dimensions than usual; in some cases there is to be no rig, the whole body of the ship being covered over by a roof. A tunnel is made through the centre of the vessel to admit the paddle propeller, and to give a passage to the water.

The inventor also describes “a box in box propeller” to be sometimes used.

In case of fire, he proposes to arrange an apparatus at or near the bow of the ship “in such manner as the forward motion thereof shall cause a large body of water to be taken into the apparatus, and from thence by pipes or otherwise conveyed to that part of the ship where combustion is suspected or has taken place.”

[Printed, 2½d. No drawings.]

A.D. 1853, January 13.—N° 95.

**FIFE, GEORGE.**—(*Provisional protection only.*)—“The object of the invention is to protect wood or iron or other materials forming exposed surfaces from decay and corrosion, and it will have this effect in all cases where a high temperature is not encountered. It consists in the application of gutta percha to such surfaces by means of any powerful adhesive matter. This may be either the gutta percha dissolved in naphtha, or shell lac dissolved in the naphtha. By this agency a perfect sheathing is

“ produced applicable to both wood and iron, and without the aid  
“ of either nails or rivets.”

[Printed, 2½d. No drawings.]

A.D. 1853, January 18.—Nº 121.

**BROWNING, HENRY.**—“ Improvements in preparing compo-  
“ sitions for coating iron and other ships’ bottoms and other  
“ surfaces.” This invention consists in combining white or red  
lead without oil, black lead, and sugar of lead, with gum copal  
dissolved in spirits of turpentine. The following proportions are  
preferred:—One part of white lead by measure, one part by  
measure of red lead, one part by measure of black lead, and one  
quarter part by measure of the sugar of lead. Grind these with  
spirits of turpentine, and add gum copal dissolved in turpentine  
(white copal varnish), and in this state apply the combined matters  
as a paint to the coating of ships’ bottoms, applying a thin coating  
at first. The sugar of lead may be left out in the second and  
subsequent coatings.

[Printed, 2½d. No drawings.]

A.D. 1853, January 20.—Nº 143.

**DE MANARA, HORACE.**—(*Provisional protection only.*)—“ Cer-  
“ tain apparatus and arrangements, applicable to steam boats and  
“ other navigable vessels, for the purpose of preventing sea  
“ sickness ” The invention consists in the use and application of  
balloons to steam boats and sailing and other vessels engaged in  
the conveyance of passengers and merchandise; these balloons are  
attached to seats, which are supported beneath by ball and socket  
joints; and the balloons are inflated with gas or other suitable  
elastic fluid, by which the seats become suspended, the intention  
thereof being to preserve a nearly horizontal position of the seats,  
notwithstanding the pitching and rolling motion of the vessel.  
In order to prevent any unnecessary movement of the balloon from  
the motion of the vessel or the wind, a strong curved bar of iron or  
other metal, passes from one side of the ship to the other, forming  
an arch across the deck. This arch serves to confine the head of  
the balloon within certain limits, regulated by the elastic cords by  
which it is attached to the bar.

[Printed, 8½d. Drawings.]

A.D. 1853, January 25.—N° 190.

WIGGINS, JOSEPH.—(*Provisional protection only.*)—The object of this invention is to manufacture a cement, which may be applied to walls for resisting the passage of moisture through them, and also to the caulking of ships, and to other analogous uses. For this purpose take slacked lime, and submit it to the action of heat to reduce it to a granular state, then mix therewith powdered glass, and, if thought desirable, any suitable pigment. Introduce this compound into a boiling mixture of tar and grease, and add thereto ox blood, or other gluten, and common resin. When the cement is to be used, heat it under a charcoal fire to bring it to a liquid state, and apply it by means of a brush to the surface to be coated.

[Printed, 2½d. No drawings.]

A.D. 1853, January 27.—N° 204.

STURDEE, ALFRED BARNES.—(*Provisional protection only.*)—A twin-stern ship or vessel, with a protected propeller. The propeller, "which may be a screw or other submerged paddle," works in a tunnel formed in the after part of the vessel, the arched roof of which gradually descends from the stern to about midships, where it resolves itself into the ordinary form of the vessel's floor. The sides of the tunnel are terminated by the sister keels and stern posts, which are here substituted for the ordinary midship stern post, and after portion of the main keel. The ship is steered by two rudders, which may be made to work simultaneously. The protected propeller can be so fitted that it may be raised through a trunk or well formed in the roof of the tunnel.

[Printed, 2½d. Drawing.]

A.D. 1853, January 28.—N° 211.

LEARMONT, JAMES.—(*Provisional protection only.*)—The invention consists in adapting and applying to ships and other vessels, pumps and apparatus connected therewith, for the purpose of discharging bilge water, and also of supplying water to the vessel. The apparatus to be used for these purposes, consists of two working pump barrels of the same diameter, united by flanges, and extending from the hold of the vessel to any convenient height above the upper deck. The lower barrel is fitted at the bottom of the vessel, and has valves at its lower end, through which water

may enter the barrel from the hold of the vessel. The water so entering the barrel, may be discharged into the sea, by means of the pump, through a horizontal pipe extending through the side of the vessel. With this horizontal pipe is connected a branch pipe, through which the water to be discharged is made to pass. This branch pipe has a stop cock in it, and so also has the horizontal pipe before mentioned, and there is a valve in the said horizontal pipe, between the two junctions of the branch pipe with the horizontal pipe, which will prevent the water from the pump barrel passing along the latter pipe, but will cause it to pass into the branch pipe, the stop cock in which being open, the water will pass through it, and enter the horizontal pipe again on the other side of the valve, and pass through the second open stop cock out into the sea. When water is required to be admitted to the vessel from the sea the stop cock in the branch pipe is closed, and that in the main horizontal pipe opened. The water from the sea then enters the horizontal pipe, passes through the stop cock and valve, and into the lower pump barrel, whence it is raised by the pump into the upper barrel, and is then carried into a pipe extending across the vessel, just under the upper deck. In this pipe a number of perforated pipes are inserted at right angles to it, so that the water entering them may be distributed, and may pass out in streams through their perforations.

[Printed, 2½d. No drawings.]

A.D. 1853, January 28.—No 219.

**RUSSELL, JOHN SCOTT.**—"Improvements in constructing ships and vessels propelled by screw or such like propeller." This invention consists in constructing ships or vessels at the stern, in such manner, that the rudder works in the part ordinarily called the "dead wood," and is below the propeller shaft. The axis of the rudder steps on the keel, and is formed with a ring at the height of the propeller shaft, to allow the shaft to work through it. The screw or other propeller works beyond or abaft the rudder, and the after part of the propeller shaft, when desired, is made capable of assuming an angular position in respect to the other part of the shaft, in order that the propeller may be raised out of the water, and for such purposes, the stern post and the "dead wood" are made double or open, to admit of the raising the after part of the propeller shaft.

[Printed, 5½d. Drawings.]

A.D. 1853, January 29.—N° 235.

BATCHELOR, HENRY.—(*Provisional protection only.*)—"This invention relates to the construction of iron ships and vessels, boilers, tanks, bridges, and other receptacles and frameworks, by combining together two or more thicknesses of metal plates crossing each other at right angles, or at some other intermediate angle. The plates are laid face to face, and are rivetted or otherwise connected together in the ordinary manner, forming a species of duplex or triple plate." By this arrangement the work is materially increased in strength, owing to the favourable angle of the plates bringing the strain across the strongest direction of the fibre.

[Printed, 2½d. No drawings.]

A.D. 1853, January 29.—N° 236.

SHAND, JAMES.—(*Provisional protection only.*)—This invention consists in "an arrangement of fire engine for ships, wherein great portability, and cheapness and simplicity of construction, are combined. The pumps are of gun metal, and fitted with gun metal flap valves, the faces and seats of which are turned even to form a good junction. The pump and air vessel are bolted to a cast-iron sole plate, which is firmly fixed inside a strong wooden case or box. The two ends of this box are keyed at the bottom; and when the engine is required for use, the ends of the box are turned down, and " lie " flat on the deck. In working the engine, the men place their feet on the ends which are turned down, thereby keeping the engine steady during the pumping action." When not in use, the handles are unshipped, and placed, with the hose, suction pipe, and other appurtenances, inside the box, and the ends are closed, thus forming a compact article, capable of being moved with facility to any portion of the ship where its service may be required.

[Printed, 2½d. No drawings.]

A.D. 1853, January 31.—N° 252.

PUGH, EDWIN.—"The object of this invention is to diminish the labor of charging ships with ballast, and discharging the ballast when required." In order to carry out this object, it is

proposed to divide the hold of the ship into several compartments of moderate dimensions, in each of which is to be placed a water-tight vessel, made of canvass or cloth, and coated or covered inside and out with gutta-percha, caoutchouc, or other suitable water-proof material, and which may be supplied with water when the ship requires ballast. Each of these vessels is to be furnished with a cock for letting out air, and an opening for admitting the water. When it is required to lighten the ship, or discharge the ballast; a cock, on a pipe connected with the water vessels, must be opened, and the water allowed to flow into the well of the ship, from which it must be pumped by the ordinary ship's pumps, or any other suitable pump. Air may at the same time be forced into the vessels by a suitable force pump, by which means the water will be more readily expelled therefrom, and the vessels will become inflated with air, and the ship be thereby rendered more buoyant; or when the water ballast is pumped out, the flexible vessels may be removed, and cargo stowed in their place. The water vessels, when inflated with air, may be removed from the lower part of the ship, and secured to any other part, in order to assist in floating the vessel.

[Printed, 8½d. Drawings.]

A.D. 1853, February 2.—N° 261.

**BELLFORD, AUGUSTE EDGARDE LORADOUX** (*a communication*).—The invention consists “in a floating or buoyant boat, vessel, or stage, having an opening extending entirely through it from top to bottom, and having for a floor either a permanently fixed stage placed midway between the top and bottom, or an interior float placed within the opening above mentioned, and having for thwarts,” either rigidly fixed cross pieces, or frames which are moveable and self-adjusting, within the opening. “The boat thus formed has the lower half, or that portion which is below an imaginary horizontal plane passing centrally through it, a practically exact counterpart of the upper half, or part situated above such plane; and hence, whether the boat be launched with one or other of the two sides in which the opening terminates upwards, it is in a proper position for service; and should it be overturned by a sea or other cause, as soon as it comes fairly over it is then again fit for service.”

[Printed, 7½d. Drawings.]

A.D. 1853, February 8.—N° 335.

BELLFORD, AUGUSTE EDOUARD LORADOUX (*a communication*).—"Improvements in the treatment of bituminous and asphaltic matters, rendering them applicable to various useful purposes." The invention consists in rolling bituminous and asphaltic matters of all kinds into sheets, by means of rollers appropriate for the purpose, such as those used for rolling out lead, &c. In order to facilitate the rolling, and to give the sheets a greater solidity and more uniform surface, the bituminous matter is rolled between layers of "continuous paper, or canvas, or any kind of cloth, or even a metallic fabric;" and in certain cases, an intermediate sheet is rolled in the middle of the laminated asphaltic matter, to which it serves as a foundation. The patentee states, that among the different purposes for which it is proposed to employ such laminated bituminous and asphaltic matters, is "sheathing of vessels by means of metallic sheets, joined with copper."

[Printed, 7½d. Drawings.]

A.D. 1853, February 15.—N° 397.

RIDSDALE, JOSEPH and ALFRED.—The invention consists in so forming or constructing ships' side lights, scuttles, or ports, that when partially opened for ventilation or otherwise, the air will enter at the upper part only, in an upward current when opened inwards; while the admission of water is greatly lessened by means of checks, guards, or boxings, upon and projecting out from the framing to which the window or door is hinged, or upon and projecting out from the window or door itself, or upon and projecting out from both the framing and the window or door. The edges of the window or door, and when necessary the hinge joints also, are to be furnished with cork or other suitable packing.

[Printed, 7½d. Drawings.]

A.D. 1853, February 21.—N° 446.

BARTON, BENJAMIN.—An improved bath, which can also be used as a life boat. "I construct a bath partly of metal and partly of vulcanized caoutchouc, or other similar vulcanized water-proof fabric, and make all the parts to fold within a case which forms the head of the bath. I construct the bottom of

plates of metal, hinged to each other and riveted to the top and foot plates, which latter I also construct of sheet-metal. The transverse ribs or stretchers are of iron or other metal, and extend from one side, under the bottom of the bath, up to the other side. Longitudinal stretchers extend on each side from the head to the foot plates, and fit over or into the transverse frames." If intended to be used on board ship, or where it might be serviceable in the preservation of life from shipwreck, it is proposed to cover this frame with two thicknesses of vulcanized india-rubber cloth, made airtight, and provided with a tube and mouth-piece, so that air may be introduced between them, and thus a life boat, capable of holding two or three persons, will be formed.

[Printed, 54d. Drawings.]

A.D. 1853, March 5.—N<sup>o</sup> 556.

WEATHERDON, BALDWIN FULFORD, and DEALTRY, CHAUNCEY.—"Improvements in the construction of certain floating vessels, and in the mode of propelling them." The improvements consist, firstly, in a mode of constructing mail and passenger vessels, so as to obtain a speed upon the water approaching to that which is obtained upon railways. For this purpose it is proposed to build vessels, or marine carriages, with a series of wheels or buoyant drums or cylinders, firmly keyed upon their respective shafts, and supported by strong framework on each side of the vessel or carriage, and so arranged and constructed as to buoy up and support the hull entirely out of the water, with the exception of a deep narrow keel, to which will be attached the rudder or rudders to steer with, and which will at the same time act as a lee board, and prevent drifting to leeward. In bad weather, the vessel may take in water ballast, and obtain a greater hold upon the water. The wheels or propelling drums are to be built in compartments, to prevent any accident occurring from a leak. "There will also be an internal pressure of air maintained or kept up within each wheel, equal to seven pounds upon the square inch, by means of a pump forcing air into each compartment thereof through an opening in the shaft, which would force out any water through the valves without diminishing the internal strength or density of the air."

Also as to attaching to vessels propelled by a screw, a deep and a keel, — in shaping the stern and stern post in such a

“ manner as the boss or centre of the screw may be less subject  
“ than at present to the water striking against it, and in substi-  
“ tuting anti-friction rollers for the ordinary bearing blocks of  
“ screw shafting.”

[Printed, 10½d. Drawings.]

A.D. 1853, March 7.—Nº 563.

**BARRINGTON, WILLIAM.**—The invention consists in constructing life boats with buoyant chambers or materials unequally distributed, so as, in combination with a weight, to cause the boat to right herself when upset; also in adapting and applying to such boats self-acting valves, by means of which water may be discharged therefrom. The buoyancy is obtained by means of chambers (either empty, or filled with buoyant material) formed at the bottom, sides, and ends of the boat, but so arranged as to give more buoyancy to one side of the boat when upset, than to the other. The chambers in the bottom and sides of the boat, are formed underneath the floor of the same, and are of unequal dimensions. There is also a chamber formed in one side at the upper part of the boat. The weight is fixed in or over the keel. The self-acting valves for the discharge of water from the boat, are placed within peculiarly formed tubes or channels, occupying a space in the centre of the boat, between its floor and bottom. The tubes or channels have a grating at each end, through which water may pass, the valves being between the two gratings. These valves open outwards, and are kept closed by the pressure of the water on which the boat is floating, but when the pressure is transferred to the inside of the boat, by her being filled or partly filled with water, they open and allow the water to escape through them.

[Printed, 5½d. Drawings.]

A.D. 1853, March 7.—Nº 573.

**LITTLE, JOHN.**—(*Provisional protection only*).—“ Improvements  
“ in cooking apparatus.” The apparatus consists of a casing of cast or malleable iron, or other material, forming an oven or cooking chamber. In a convenient part of this is placed the fire grate, either divided off from the oven by a partition or wire screen, or left entirely open. The oven is thus heated by the fire being inside, or partially inside, the oven or cooking chamber.

[Printed, 2½d. No drawings.]

A.D. 1853, March 9.—N° 606.

CAMPIN, FREDERICK WILLIAM.—(*A communication from Messrs Owerduyn and Droinet*).—"An instrument for measuring  
" the steerage-way of vessels, and the rapidity of currents of water  
" and air, applicable to ventilating ships and railway carriages."  
" This invention consists, first, in the application of hydrodynamic,  
" and more especially of negative pressure, as a means of measuring the speed of vessels and currents." Secondly, "in the use  
" and arrangement of metallic plates or elastic tubes for the purpose of determining the results of this pressure." "Negative  
" pressure is produced either by cylindrical or by double-coned tubes, commonly called Venturi's tubes. "Their longitudinal  
" section represents two truncated cones united at top. They  
" will generally be used in preference to the cylindrical tubes, without, however, entirely superseding them." "A single tube  
" to each vessel is sufficient for the proposed object, but for greater security two would be preferable. They are placed  
" parallel to the keel on each side of the ship, and under the level of the water, securely fixed, but so as to allow of their being  
" easily removed from the water when required to be examined for repair, or the removal of adhering substances. If but one  
" tube be employed it may be advantageously fixed on the larboard or starboard side, but would be better placed forward, in  
" which case it must be forked at the posterior extremity." The tube "is in connexion with a mercurial syphon or manometer, and  
" in the mercurial syphon the rising and falling of the mercury therein is the means of indicating the speed of the vessel or the  
" current."

These tubes may also be applied for the purpose of ventilating the ships. In this case the tube is to be furnished with a hook at each extremity, to which is attached a cord or chain. It must be immersed in the water at any part of the ship, with its smaller end pointed forwards. It has, like the other tubes, at its smallest section, a connecting pipe, but of a larger diameter. Fire-engine tubes might be usefully employed in this way. This tube or pipe ought to be flexible. The end of it opposite to that connected with the coned tube, is placed in the space whence the foul air is to be expelled. These arrangements being made, the mere progress of the vessel effects the required ventilation. This method

of ventilation may be usefully combined with that in ordinary use, which is to infuse, by means of a canvass funnel, fresh air from the deck into the interior of the vessel. The same apparatus might, in certain cases at sea, be made available for pumping water.

[Printed, 9½d. Drawings.]

A.D. 1853, March 26.—N° 724.

SYMONDS, ERASMUS.—(*Provisional protection only.*)—"An improved self-acting plug for barges, boats, and other vessels." This consists of a metal cup, the bottom of which is immersed in the water in which the vessel floats, and is pierced with a number of holes. The top of the cup is within the boat, and is covered by a metal plate, half of which is also pierced with holes. A central axis passes through the cup, up which a float is made capable of sliding, from a pressure of water on the under side, so as to cover the holes in the upper plate, and prevent the ingress of water. These holes may also be covered on the upper side by a circular disc, capable of motion about the axis, one half of which disc, is pierced with holes, corresponding with those in the plate, and the other is left blank.

[Printed, 4½d. Drawings.]

A.D. 1853, March 29.—N° 742.

BAYLISS, SAMUEL.—(*Provisional protection only.*)—The invention consists in a method of giving to sea-going vessels a greater degree of longitudinal and transverse strength, than has been hitherto attainable; by constructing a rectangular iron tube in the middle of the ship, extending from the top of the keel to the lower deck, and from one end of the ship to the other. The tube is to be composed of plate and angle iron, and is to have the top and bottom portions divided into cells or divisions, for securing the requisite strength and stiffness. For giving transverse strength, similar tubes are to be employed as bulkheads, connected at one end with the great longitudinal tube, and at the other with the sides of the vessel.

[Printed, 4½d. Drawings.]

A.D. 1853, April 2.—N<sup>o</sup> 786.

**ANDERSON, Sir JAMES CALER.**—"Improvements in locomotive engines." Amongst other improvements, the inventor describes a chimney cap, designed to increase the draught in locomotive engine boilers, and which may be used to cure smoky chimneys, or to draw the foul air out of ships' holds. The cap is divided by vertical partitions, into compartments, so as to cause the atmospheric air to pass through it with great velocity, and thus draw the heated or foul air, out of the chimney or ventilating tube.

[Printed, 1s. 6d. Drawings.]

A.D. 1853, April 6.—N<sup>o</sup> 827.

**RADFORD, WILLIAM.**—"Improvements in the construction of metallic beams or bracings, and metallic sheets or plates, applicable to the building of ships and other structures where lightness and strength are required." This invention relates, firstly, to an improved manufacture of beams and bracings, to be used in place of simple angle iron. In constructing, for example, the framing of a ship according to the invention, metal bars are rolled of the required length, and of the form of T-iron, the central rib of which is shallower than usual. While these are hot, they are bent to the curves required, for forming the ribs or other part of the ship or structure. After the frame is formed, a hollow rolled bar or trough iron is worked against its inner surface, the faying surfaces of the two bars exactly fitting each other. The two bars may be either riveted together, or left unconnected. It will not be necessary to add the second bars to all the ribs, except for vessels of war. To cover or enclose this framing and complete the hull of the ship, plates are employed, which when put together, will form in appearance a butt joint, and possess the security of the ordinary lap joint. In the provisional specification, the inventor states, that for this purpose he rolls plates with one or both of their edges recessed or bent back, to the form of a returned right angle, such recess being equal in depth to the thickness of the metal plates employed. But the plates described in the final specification are scarphed edges, as follows:—"The sheets or plates are of two kinds; the one may be called the parallel plates; they are made of any convenient length and from twelve inches to two feet wide; they are rolled with broad bevelled edges, and before applying them to the sides

of the ship, they are placed in a planing machine, and a flat shoulder is planed away at the inner part of the bevelled edge, so as to receive the edge of the next plate, which is to be accurately fitted thereto. These parallel plates are riveted in their places on the ribs of the ship, at certain distances apart; after which the intermediate plates are to be fastened thereon by bolts or rivets. By this means both the inner, and outer surfaces of the plates, are made flush.

[Printed, 5½d. Drawings.]

A.D. 1853, April 8.—N° 852.

HERBERT, GEORGE.—“Improvements in constructing and “mooring light vessels, buoys, and other similar floating bodies.” This invention consists in making the outer surface of the bottoms of light vessels, concave or conical, combined with means of taking in and letting out cable, in such manner, that the cable shall be held, and the vessel moored, at the upper part of the conical or concave bottom. Also in constructing buoys and such like floating bodies, with similar concave bottoms, and fixing the mooring chains or cables to the upper parts of the concavities. The object of this arrangement is to moor such vessels “at or as near as may “be to their lines of floatation, and, if convenient, at or as near as “may be to their centres of gravity.”

[Printed, 7½d. Drawings.]

A.D. 1853, April 14.—N° 913.

CRICHTON, ALEXANDER.—“Improvements in the fittings of “bilge pumps and injection cocks of iron steamers and sailing “vessels.” The invention consists in applying a drain, perforated with numerous holes, on the keel, and under one or more floorings, into which drain the pipes of bilge pumps and bilge injections are to be led. Doors are fitted in the drain, which can be lifted when desired, to allow a chain with a brush thereon, to be drawn to and fro to cleanse the interior.

[Printed, 4½d. Drawings.]

A.D. 1853, April 20.—N° 951.

WEIGHT, SAMUEL.—“Improvements in ventilating mines, “sewers or drains, ships, buildings generally, and other localities.” The invention consists in the use of a rotary fly, placed within a funnel-shaped or conical box or casing, made of cast or sheet iron,

**Figure 1**

**Figure 1**

**Figure 1**

**Figure 1**

[illegible]

**Figure 1**

**Figure 1**

**Figure 1**

A.D. 1853, May 7.—N° 1132.

CHAPLIN, ALEXANDER.—(*Provisional protection only.*)—This invention relates to the construction of ships and boats of iron and wood combined. The vessel is to be built of iron plates, with the frames outside, so that the interior is flush and clear. Then the spaces outside the vessel between the frames, as well as the spaces or hollows of the frames themselves, are filled up with wood planking to the depth of the frames, so as to produce a flush surface externally. Such vessels may be sheathed over all, with copper or other sheathing, or the wood may be left uncovered.

By another mode, the shell or main plating of the vessel may be built as at present, with the frames inside, whilst wooden frames are put on outside, and well attached to the plates, and the spaces between these timber frame pieces filled up with timber as before.

A very strong joint may be made under this system, by riveting the plates with butt joints, covering over the line of joint in the inside of the vessel, with a flat plate or strip; the connexion being formed by rivets put through on each side the joint line, which rivet on the external frame pieces at the same time.

[Printed, 2½d. No drawings.]

A.D. 1853, May 11.—N° 1162.

JORDESON, THOMAS POWDITCH.—(*Provisional protection only.*)—The invention consists in putting timber together, and securing it in such a manner, as to form a kind of temporary ship, which may have sails, rigging, &c., applied to it, and be transported or navigated across the seas, without the necessity of loading and unloading ships for its conveyance. The timbers and planking of which the raft is composed, are to be secured by means of strong chains, which may be tightened by powerful screws. The fore part of the raft is formed sharp, so as to make it sail better than it would otherwise, and, if required, a sliding keel of planks may be formed upon it. The after part, which may, or may not, be planked over, is formed with a great "overhang," and has an upright stern post adapted and applied to it, with a rudder.

[Printed, 2½d. No drawings.]

A.D. 1853, May 20.—N° 1249.

**SCHOLICK, SAMUEL.** The invention consists in "employing  
 " straight timber to construct the timbers or framings of ships  
 " and vessels by causing the straight timber to be cut with longi-  
 " tudinal saw cuts, so that by removing portions the remaining  
 " straight timbers may be caused to bend with facility, and assume  
 " the contour desired, the parts where portions are cut away scarf-  
 " ing or coming together so as to form good joints."

In building a ship the timbers are sawn out first, and put up to season till all is ready for putting the ship together. They are then steamed, and bent on a prepared platform, and allowed to cool in that position.

[Printed, 5½d. Drawings.]

A.D. 1853, May 21.—N° 1262.

**BELLFORD, AUGUSTE EDOUARD LORADOUX** (*a communication*).—This invention consists in constructing navigable vessels of one or more hollow cylinders, or other circular floats, placed in or upon the water with their axes horizontal, and of sufficient size and buoyancy to carry the required burden without causing the submersion of more than about one-eighth of their diameter. "The burden (and also the motive power, if the vessel is to be  
 " propelled by power carried by itself,) is to be supported upon a  
 " framing, carriage, or platform outside or within the cylinder or  
 " cylinders; the said carriage, framing, or platform resting and  
 " running on suitable tracks in such a way as to remain station-  
 " ary while the cylinder or cylinders revolve. Each cylinder has  
 " paddles, similar to those of the common paddle-wheel, attached  
 " to its outer periphery. If the vessel is to be impelled by sails,  
 " they are applied to the carriage, framing, or platform, and the  
 " wind acting upon them impels the vessel onward; the cylinder  
 " or cylinders being caused to revolve and roll over or upon the  
 " water, like wheels, by the resistance offered to the floats by the  
 " water; but if steam or other motive power be employed for pro-  
 " pulsion, rotary motion is given to the cylinder or cylinders, and  
 " the resistance offered to the floats causes them to roll over the  
 " water." The float may be of wood or iron, and when there is only one, is to have an opening in each end of about one-third the diameter of the end, for the purpose of ventilating and lighting

the interior, which contains cabin accommodation and freight. When the vessel is composed of two or more closed floats, the motive power, and suitable houses or receptacles for passengers, freight, fuel, and stores, are placed on a suitable carriage outside the floats, and are supported by them.

[Printed, 8½d. Drawings.]

A.D. 1853, May 25.—Nº 1281.

BAUER, WILLIAM.—(*Provisional protection only.*)—This invention consists in so forming a vessel or boat, which it is proposed to call an “hyponaut apparatus,” that it will either float on the surface of the water, or it may be made to descend under the surface of water, and when in either of these situations it may, by machinery within and outside the boat, be propelled and guided in any required direction. For the purpose of propulsion a screw propeller may be used. The boat is steered or guided in its lateral motions by a rudder, similar to those in ordinary use, and in its upward or downward motion by fins, which can be placed at any required angle with the horizon. In order to cause the boat to descend or ascend, a certain quantity of water is received into or discharged therefrom; in addition to which the boat carries a certain quantity of ballast, part of which can be instantaneously discharged when required. A weight, adjustable in a longitudinal direction, serves to depress the boat either by the bow or stern. The boat is provided with windows and with flexible water-tight sleeves, so that a person in the boat, by introducing his hands and arms through the sides of the boat into the sleeves, may employ his hands for any purpose he may require. “When the air in the  
“boat, which is of no more than the simple atmospheric pressure,  
“becomes foul by respiration or otherwise, a fresh supply may be  
“drawn down a tube from above the surface of the water, and the  
“foul air be at the same time driven out by double-acting air-  
“pumps. The motive power is so generated as not to consume  
“any atmospheric air. It consists of a mixture of nitre, sulphur,  
“charcoal, and ammonia, which, on being ignited, produces a  
“gas or vapor of the requisite tension to work a piston similar to  
“that of a steam engine.”

[Printed, 2½d. No drawings.]

A.D. 1853, June 7.—N° 1396.

LIPSCOMBE, FREDERICK.—“Improvements in the construction of ships and boats.” The submerged portion of the hull is to be of such a shape, as that its longitudinal section will show, at the fore end of the load water line, “a sharp point, or nearly so, the inclination from that point being in a straight line, or nearly so, gradually and uniformly downwards to a distance not less than nine-sixteenths or greater than seven-eighths of the entire length of the submerged portion of the hull. A vessel so formed turns aside the water with much greater ease than the present class of ship, whilst it is elevated to the greatest possible extent as it passes on its course. The keel is carried down to the required depth from stern to stern, and the posterior part forming the stern is of the usual shape.”

[Printed, 5½d. Drawings.]

A.D. 1853, June 10.—N° 1423.

WESTWOOD, JOSEPH, and BAILLIE, ROBERT.—The invention consists “in constructing the stem, stern post, or stern frame (where screw propellers are used), keel and keelson, of iron ships, of plates of iron rivetted or otherwise fastened together so as to form one solid mass, in lieu of constructing such parts of one thickness of metal”; plates of greater or less thickness and length being employed, according to the amount of strength desired to be obtained. The keelson is formed “by carrying up one, two, or more of the central keel plates above the level of the keel, and rivetting or otherwise fastening thereto side plates of iron, until the keelson is formed of the required dimensions.”

[Printed, 2½d. No drawings.]

A.D. 1853, June 13.—N° 1432.

BUCHANAN, JOHN.—(*Provisional protection refused*)—This invention consists “in constructing ships, vessels, or boats with a longer bow and run, decreasing in depth aft somewhat in proportion as they increase in breadth, the position of the main breadth being ascertained by geometrical formula, and may be constructed when of iron so as to affix thereto a wooden stern

“ keel and stern post, sheathing the same without perforating the  
“ hull for such purpose.”

[Printed, 2½d. No drawings.]

A.D. 1853, June 13.—N° 1434.

FREMIN, GONSAL AUGUSTE HIACINTHE JUSTIN.—(*Provisional protection only.*)—“ The invention consists in constructing  
“ steam boats with two keels, one placed above the other in an  
“ opposite direction, and exactly similar; one is immersed in the  
“ water, and the other in the atmosphere; all the curves are seg-  
“ ments of circles, and the shape of the boat is that of a closed  
“ elongated shell, with two valves having a sharp end similar to  
“ a spindle; the velocity of the displacement of the water is about  
“ sixteen times less than the motion of the boat, therefore the  
“ resistance to be overcome is reduced to the 256th part, which  
“ the immersed midship frame has to surmount. It is applicable  
“ to every kind of propeller.”

[Printed, 4½d. Drawings.]

A.D. 1853, June 15.—N° 1449.

WILLIAMS, CHARLES WYE.—The invention relates to a peculiar mode of manufacturing wrought-iron sheets, and also the iron plates usually called “ boiler plates,” so that they shall present a series of ribs or ridges on one or both sides, by which means their strength is materially increased, and when used in the construction of boilers, with their ribbed sides exposed to the fire, they present an enlarged heating surface. The particular configuration, thickness, length, continuity, or number of such ribs or ridges, must be regulated by the convenience of manufacture, and the object desired to be attained; whether strength, heating surface, or mere ornamental effect. Thus, iron plates with broad and shallow ribs, may be found most suitable for iron ship-building, the ribs being on the inside of the vessel.

[Printed, 7½d. Drawings.]

A.D. 1853, June 15.—N° 1450.

MACINTOSH, JOHN.—This invention consists in constructing  
“ boats, hollow vessels, and buoys of waterproof fabric, and in  
“ giving form thereto when required for use by means of ribs of  
“ wood or metal.” In the boat described by the inventor there

are two ribs forming the gunwales, and another rib to which the false keel is fixed. These ribs, when the boat or vessel is not required for use, lie close together and parallel to each other. They are connected by means of a strong waterproof fabric, which, when the frames or ribs are thus packed together, folds into and occupies only a small space. The boat or vessel is expanded by means of the seats or "thwarts." Buoys are made with ribs in like manner, but are enclosed on all sides with waterproof fabric in the manner of a flexible globe. "The upper and lower ends of the ribs are connected with a disc at top and bottom, and a screw is passed through the centre of the upper disc, and is connected with the lower disc, so that by turning the screw the lower and the upper disc are drawn towards each other, by which the ribs are bent, and the apparatus expanded into a globular or other form, according to the arrangement of the parts."

[Printed, 5½d. Drawings.]

A.D. 1853, June 16.—N° 1460.

FIELD, WILLIAM HENRY GREY.—(*Provisional protection only.*)—"Certain improvements in the construction of barges and vessels, and in the mode of steering." The improvements consist in building barges and vessels of such form, that they may be more conveniently adapted for being worked in trains upon canals, rivers, or other navigable waters. The barges or vessels are formed with a hollow or re-entrant stern of the same shape as the bow, so that the bow of a similar vessel will fit into it. A rudder is formed at the after extremity of each of the straight sides. The vessels are united loosely at their extremities, by a short loop of rope or chain on each side, and another rope or chain is stretched tightly along the whole train on each side, for the purpose of steering, any required change in direction being effected, by slacking out one of the ropes, and causing the train to assume a curved form.

[Printed, 4½d. Drawings.]

A.D. 1853, June 18.—N° 1482.

HALL, WILLIAM.—The invention consists in employing in the construction of ships, wood treenails with screw threads cut thereon, instead of the smooth treenails in ordinary use. The application of them described by the inventor, is to the sides of

wooden vessels built on the diagonal principle, or with several thicknesses of plank.

[Printed, 6½d. Drawings.]

A.D. 1853, June 23.—N° 1529.

BURROWS, JAMES.—(*Provisional protection only.*)—"Certain improvements in the formation of such metallic plates as are required to be conjoined by rivetting or other similar fastening." The invention applies chiefly to the formation of what are technically termed "lap joints," and consists in rolling or otherwise forming the sides or ends, or both the sides and ends, or other parts of such plates where the rivet holes are to be formed, thicker or stronger in substance than the body of the plate, in order that when these holes are formed, those parts of the plates in which they are formed, shall remain as strong and as capable of resistance to pressure as any other portion of the plates. This object may be accomplished when the holes are only required at one side or end of the plates, "by rolling them taper in thickness." "But where the holes are required at both sides or ends, or at both sides and ends, of the said plates, or in any other intermediate part, it is to be attained by rolling or otherwise forming a 'swell' at the required part."

[Printed, 2½d. No drawings.]

A.D. 1853, July 1.—N° 1585.

GETTY, JOHN.—"Certain improvements in ship building," consisting, according to the provisional specification, firstly, in the construction of keels of ships and other vessels, of a series of thicknesses of rolled plate iron, placed side by side, and bolted or fastened together, the several plates being made to break joints.

Secondly, in "leaving a space below the iron plate forming the lower part of the ribs and the floor of the lower deck, so as to allow a free passage to the pumps for any water that may get into the hold or bilge of the vessel."

Thirdly, in "constructing masts of vessels used for navigation with a combination of timber and iron, by forming the centre of the mast with plates of iron placed at right angles to each other, and filling the spaces forming the quadrants with timber, and connecting the whole by iron hoops or clips or any known means."

are two ribs forming the gunwales, and another rib to which the false keel is fixed. These ribs, when the boat or vessel is not required for use, lie close together and parallel to each other. They are connected by means of a strong waterproof fabric, which, when the frames or ribs are thus packed together, folds into and occupies only a small space. The boat or vessel is expanded by means of the seats or "thwarts." Buoys are made with ribs in like manner, but are enclosed on all sides with waterproof fabric in the manner of a flexible globe. "The upper and lower ends of the ribs are connected with a disc at top and bottom, and a screw is passed through the centre of the upper disc, and is connected with the lower disc, so that by turning the screw the lower and the upper disc are drawn towards each other, by which the ribs are bent, and the apparatus expanded into a globular or other form, according to the arrangement of the parts."

[Printed, 8½d. Drawings.]

A.D. 1853, June 16.—N° 1460.

FIELD, WILLIAM HENRY GREY.—(*Provisional protection only.*)—"Certain improvements in the construction of barges and vessels, and in the mode of steering." The improvements consist in building barges and vessels of such form, that they may be more conveniently adapted for being worked in trains upon canals, rivers, or other navigable waters. The barges or vessels are formed with a hollow or re-entrant stern of the same shape as the bow, so that the bow of a similar vessel will fit into it. A rudder is formed at the after extremity of each of the straight sides. The vessels are united loosely at their extremities, by a short loop of rope or chain on each side, and another rope or chain is stretched tightly along the whole train on each side, for the purpose of steering, any required change in direction being effected, by slacking out one of the ropes, and causing the train to assume a curved form.

[Printed, 4½d. Drawings.]

A.D. 1853, June 18.—N° 1482.

HALL, WILLIAM.—The invention consists in employing in the construction of ships, wood treenails with screw threads cut thereon, instead of the smooth treenails in ordinary use. The application of them described by the inventor, is to the sides of

wooden vessels built on the diagonal principle, or with several thicknesses of plank.

[Printed, 6½d. Drawings.]

A.D. 1853, June 23.—N° 1529.

BURROWS, JAMES.—(*Provisional protection only.*)—"Certain  
" improvements in the formation of such metallic plates as are  
" required to be conjoined by rivetting or other similar fasten-  
" ing." The invention applies chiefly to the formation of what  
are technically termed "lap joints," and consists in rolling or  
otherwise forming the sides or ends, or both the sides and ends,  
or other parts of such plates where the rivet holes are to be formed,  
thicker or stronger in substance than the body of the plate, in  
order that when these holes are formed, those parts of the plates  
in which they are formed, shall remain as strong and as capable of  
resistance to pressure as any other portion of the plates. This  
object may be accomplished when the holes are only required at  
one side or end of the plates, "by rolling them taper in thickness."  
" But where the holes are required at both sides or ends, or at  
" both sides and ends, of the said plates, or in any other inter-  
" mediate part, it is to be attained by rolling or otherwise forming  
" a 'swell' at the required part."

[Printed, 2½d. No drawings.]

A.D. 1853, July 1.—N° 1585.

GETTY, JOHN.—"Certain improvements in ship building,"  
consisting, according to the provisional specification, firstly, in  
the construction of keels of ships and other vessels, of a series of  
thicknesses of rolled plate iron, placed side by side, and bolted or  
fastened together, the several plates being made to break joints.

Secondly, in "leaving a space below the iron plate forming  
" the lower part of the ribs and the floor of the lower deck, so  
" as to allow a free passage to the pumps for any water that may  
" get into the hold or bilge of the vessel."

Thirdly, in "constructing masts of vessels used for navigation  
" with a combination of timber and iron, by forming the centre  
" of the mast with plates of iron placed at right angles to each  
" other, and filling the spaces forming the quadrants with timber,  
" and connecting the whole by iron hoops or clips or any known  
" means."

are two ribs forming the gunwales, and another rib to which the false keel is fixed. These ribs, when the boat or vessel is not required for use, lie close together and parallel to each other. They are connected by means of a strong waterproof fabric, which, when the frames or ribs are thus packed together, folds into and occupies only a small space. The boat or vessel is expanded by means of the seats or "thwarts." Buoys are made with ribs in like manner, but are enclosed on all sides with waterproof fabric in the manner of a flexible globe. "The upper and lower ends of the ribs are connected with a disc at top and bottom, and a screw is passed through the centre of the upper disc, and is connected with the lower disc, so that by turning the screw the lower and the upper disc are drawn towards each other, by which the ribs are bent, and the apparatus expanded into a globular or other form, according to the arrangement of the parts."

[Printed, 5½d. Drawings.]

A.D. 1853, June 16.—N° 1460.

FIELD, WILLIAM HENRY GREY.—(*Provisional protection only.*)—"Certain improvements in the construction of barges and vessels, and in the mode of steering." The improvements consist in building barges and vessels of such form, that they may be more conveniently adapted for being worked in trains upon canals, rivers, or other navigable waters. The barges or vessels are formed with a hollow or re-entrant stern of the same shape as the bow, so that the bow of a similar vessel will fit into it. A rudder is formed at the after extremity of each of the straight sides. The vessels are united loosely at their extremities, by a short loop of rope or chain on each side, and another rope or chain is stretched tightly along the whole train on each side, for the purpose of steering, any required change in direction being effected, by slacking out one of the ropes, and causing the train to assume a curved form.

[Printed, 4½d. Drawings.]

A.D. 1853, June 18.—N° 1482.

HALL, WILLIAM.—The invention consists in employing in the construction of ships, wood treenails with screw threads cut thereon, instead of the smooth treenails in ordinary use. The application of them described by the inventor, is to the sides of

wooden vessels built on the diagonal principle, or with several thicknesses of plank.

[Printed, 6½d. Drawings.] .

A.D. 1853, June 23.—N° 1529.

BURROWS, JAMES.—(*Provisional protection only.*)—"Certain improvements in the formation of such metallic plates as are required to be conjoined by rivetting or other similar fastening." The invention applies chiefly to the formation of what are technically termed "lap joints," and consists in rolling or otherwise forming the sides or ends, or both the sides and ends, or other parts of such plates where the rivet holes are to be formed, thicker or stronger in substance than the body of the plate, in order that when these holes are formed, those parts of the plates in which they are formed, shall remain as strong and as capable of resistance to pressure as any other portion of the plates. This object may be accomplished when the holes are only required at one side or end of the plates, "by rolling them taper in thickness." "But where the holes are required at both sides or ends, or at both sides and ends, of the said plates, or in any other intermediate part, it is to be attained by rolling or otherwise forming a 'swell' at the required part."

[Printed, 2½d. No drawings.]

A.D. 1853, July 1.—N° 1585.

GETTY, JOHN.—"Certain improvements in ship building," consisting, according to the provisional specification, firstly, in the construction of keels of ships and other vessels, of a series of thicknesses of rolled plate iron, placed side by side, and bolted or fastened together, the several plates being made to break joints.

Secondly, in "leaving a space below the iron plate forming the lower part of the ribs and the floor of the lower deck, so as to allow a free passage to the pumps for any water that may get into the hold or bilge of the vessel."

Thirdly, in "constructing masts of vessels used for navigation with a combination of timber and iron, by forming the centre of the mast with plates of iron placed at right angles to each other, and filling the spaces forming the quadrants with timber, and connecting the whole by iron hoops or clips or any known means."

According to the final specification, the improvements have reference only to the construction of the lower parts of iron vessels, and consist in "so arranging and shaping the frames or ribs and " the garboard strakes of the vessel as will ensure an uninterrupted passage to the pumps, from stern to stern of the vessel, " for any water that may collect in its hold or bulge," for which purpose a channel is formed between the top of the keel and the under sides of the ribs or of the floor angle irons, by the insides of the garboard strakes, which are bent downwards on each side of the vertical keel plate.

[Printed, &c. Drawings.]

A.D. 1853, July 11.—N<sup>o</sup> 1649.

**HOPWOOD, HENRY BROUGHAM.**—This invention consists in the application of apparatus to ships' ports or scuttles, whereby they may be firmly secured and readily opened. The port or scuttle is supported on axes and collars, which are carried by and move on two horizontal screws, which project inwards at right angles to the ship's side, one on each side of the framing of the port hole. " Each of the collars carries a pinion having a female screw " formed through its axis, and through these the horizontal screws " pass, and the pinions and collars which support the port or " scuttle are caused to move to and from the port hole by means " of a toothed wheel turning freely on the outer circumference of " the port or scuttle:" this toothed wheel takes into the teeth of the pinions on the horizontal screws, " and receives motion from " a pinion on an axis turning in bearings on the frame of the " port. this pinion takes into teeth formed on the inner circumference of the toothed wheel on the circumference of the port, " and the axis of the pinion is jointed to a bar which slides in a " fixed support, the other end of the bar having a handle to give " motion to the pinion which drives the toothed wheel revolving on the circumference of the port), and when the port or " scuttle is withdrawn to its farthest extremity a projection on the " face of the toothed wheel comes in contact with a fixed stop on " the port or scuttle, and it may then be moved on its axis to any " desired angle, and the handle on the sliding bar is so constructed that it can readily be detached when the port or scuttle " has been closed or opened in order to prevent its being disturbed."

[Printed, &c. Drawings.]

A.D. 1853, July 12.—N° 1656.

**BURNS, ANDREW.**—The invention relates to a system or mode of economising labour and time in the construction of iron ships and other metallic structures and vessels, by the use of an arrangement for setting out and marking the correct situations of the rivet or bolt holes in the plates and frames, together with the exact shape of the plates used in works of this nature.

In constructing an iron ship, the structure is commenced with the regular pitching of the holes through the frames which hold the shell plates, using a template or guide frame of wood or metal arranged in the form of an open parallelogram. This template is capable of being set to any angle, either in length or breadth, by cross and diagonal expanding stays secured by screws. An adjustable template set for straight parallel work, may be composed of four main frame bars, with additional transverse bars, and a diagonal tie. For curved or differentially shaped work, the main longitudinal or side pieces, are made up of a series of separate lengths or sections of metal plates, placed end to end, and overlapping each other. These lengths are bolted together by lateral overlapping pieces, the bolt holes in which are elongated to admit of a slight longitudinal adjustment. The sections of the longitudinal plates correspond in length to the distances between the ship frames, and each section is provided with a cross bar, which, whilst it serves to stiffen the entire template, is chiefly for the purpose of taking off the positions of the holes in the frames, by means of which the plates are attached to the frames. The cross bars are slotted longitudinally, both for adjustment upon the longitudinal plates by bolts, and for the adjustment of the marker plates. These latter are short plates, with slots at one extremity for bolting to the cross bars, and with round holes at the other end, which being set over the holes in the ship frames, and then fixed in such position, serve to mark the corresponding holes in the plates.

To prevent the angular working of the template, a diagonal stay is bolted to any diagonally disposed points of connexion of the longitudinal plates. The stay is made in two or more pieces, united by bolts and slots, so as to be adjustable in length, and two or more of such diagonal stays may be employed. In setting the template, the various connecting bolts being loosened, the cross bars are applied to the edges of the ship frames, and the different

parts being shifted, as the case may require, the bolts are screwed tightly up, and the entire template frame is removed from the ship's side, and applied to the plate to be punched and cut, when the outline and the various rivet holes may be marked off with the greatest facility. The end plates of the template may be fitted with rivet hole markers of a varying pitch. These markers consist of a series of short plates, articulated together in a zigzag manner, and made with tubular joints, which serve as marking holes for the rivets. The extremities of this series or chain of plates, are jointed to a projection on the two adjacent ends of the longitudinal plates, and a pin is fixed to the centre of the under side of each plate, which pin works in a guide groove in the end plates. On either side of the guide groove are two slots, which lie immediately below the tubular joints of the plates, and admit of the rivet holes being marked through them. By this arrangement the pitch of the holes adjusts itself to the width of the plate, for as the longitudinal plates of the template are brought nearer together, the zigzag chain contracts, and so reduces the pitch of the holes. If, on the other hand, the longitudinal plates are set further apart, the zigzag chain will be elongated, and the pitch of the holes correspondingly increased.

[Printed, 7½d. Drawings.]

A.D. 1853, July 19.—N<sup>o</sup> 1711.

**BRIMS, DONALD.**—"An improved safety apparatus for the protection and preservation of life on water." This consists of a vessel nearly cylindrical, but sharpened somewhat at the extremities to make a bow and stern, and constructed of wrought iron, wood, or other materials. The ribs consist of hoops passing entirely round the vessel, over which the plating or planking is worked. Apertures are made in the upper part or roof of this vessel, to give admission to the interior, and, in fine weather, to give the crew an opportunity of propelling it by oars; but in bad weather they are to be closed, and the vessel will be managed by a man looking out ahead through a bull's-eye, and by the steersman, who sits in a cylindrical box raised above the vessel, and framed partially with glass.

The ship has a single mast with a spritsail. The mast can be raised or lowered at pleasure by machinery in the vessel, and the sail can also be managed from the interior of the vessel. In

addition to this means of propulsion, a screw is fitted in the dead wood, and feathering paddles at the sides; both screw and paddles to be worked by hand. The inventor also describes a peculiar description of pump for relieving the vessel of water, and air pumps for supplying fresh air, for filling certain air chambers, and for producing vacuums in various parts of the vessel. Loop holes are to be cut for musketry; and the sides covered with soft matting, as a defence against ordnance. A novel arrangement described for stopping leaks. An anchor of peculiar construction, and davits for lowering the boat, are also described. To facilitate the transport of the vessel on land, it is mounted on a carriage, which may be drawn by men or horses.

[Printed, 11½d. Drawings.]

A.D. 1853, July 25.—N° 1743.

DE ROSTIN, JOSEPH ARISTIDE FURST.—(*Provisional protection only.*)—"The invention consists in constructing an external hulk in the shape of trellis work, serving to enclose an external (internal?) hulk shaped and constructed as the external one. They are connected together by rods. The interstice or vacant space between them is filled with fascines made of materials of little value, such as bundles of wood, &c., having a conical shape, and disposed in such a manner that their basis should be placed upward and level with the hulk, and their apex towards the inside. These fascines may be rendered waterproof by felting or any suitable means. They are so disposed as to allow a free access to any part of the hulks to stop leakage, or to make any other necessary repairs; they can be removed with facility, and the space they occupy used for other purposes. In the interior of the internal hulk wasting (coasting?) vessels, steamers, and othercrafts for river and other traffic may be placed, or any bulky articles which could only be carried by being taken to pieces. The boats put in the internal hulk can carry passengers, goods, &c., and the hulk may be separated into parts either from the keel or from the midship beam."

[Printed, 2½d. No drawings.]

A.D. 1853, July 29.—N° 1777.

NEWTON, WILLIAM EDWARD (*a communication*).—This invention consists in depositing upon a metallic or non-metallic

surface, either a pure metal, such as copper or other metal, or an alloy of metals, so as to give the appearance of brass, bronze, or other ornamental metallic surface. "The alloys which it is intended to employ are, first, an alloy of zinc and copper, which will give the appearance of brass; second, an alloy of copper and tin, which will resemble bronze in appearance; third, an alloy composed of the three metals, copper, zinc, and tin. The solutions to be employed in the process may be of various kinds, but principally consist of double salts of the metals and some alkaline base. These metallic solutions are to be mixed together in proportions depending upon the particular color required, and the metals may be deposited either with or without the assistance of galvanic or electrolytic action." Among the several uses to which it is proposed to apply this invention, is included "preserving metals employed in the construction of iron vessels."

(Classified 1st. No drawings.)

A D 1839, August 2.—N° 1804.

JOSEPH WATSON HENRY — (A communication).—"Improvement in the manufacture of a composition resembling 'papier mache' and 'carton pierre,' and applicable to the same purposes to which 'papier mache' and 'carton pierre' are applied, parts of which invention may also be applied to the construction of ships and boats and roofing." "The improvement is the application and manufacture of a composition to be called 'papier mache' and 'carton pierre,' and with such materials to make the various articles that are made of 'papier mache' or 'carton pierre' and also articles of use in the construction of houses and ships and the roofing and wainscoting and making floors and partitions doors and shutters, &c." It is proposed to mix with the composition a small proportion of oil of shale or of any other volatile oil or of camphor of turpentine, or of any other substance that may have the property of making the composition impervious to insects or vermin of the kind that are destructive in damp situations and warm climates."

(Classified 1st. No drawings.)

A.D. 1853, August 2.—N° 1808.

**BOURA, MATTHIAS EDWARD.**—"Improvements in supplying ships or other vessels with water, air, or ballast." This invention consists in using watertight bags either to hold water for ballast, &c., or to hold air for obtaining buoyancy. To make the bags for the purposes of this invention, take canvass or other suitable fabric, and saturate it with a solution of india-rubber, gutta-percha, or other elastic gum. Then cut it into such shapes or forms as may be required, and place between such pieces of cloth, a layer or layers of sheet india-rubber or gutta-percha, or the two combined, or attach them together with a solution of india-rubber or gutta-percha. Having thus prepared the material, form it into bags or vessels of the required size, capacity, or substance. When used for ballasting ships, the bags or vessels are to have a valve for water, and one or more for air. When not required for ballast, they can be stowed away in any convenient part of the ship. Should the ship be water-logged, they can be filled with air by means of an air pump, and being lashed under or to the sides of the ship, will take its weight, so that it will form a perfect life boat or buoy. The same bags, when lashed or fastened together, will form a raft, either alone or combined with spars or timbers, in case of shipwreck. "The mode of filling such bags with water for ballast is as follows: an aperture is made in the ship's side below water mark with an air and watertight valve, so that when the ship is unloading the ballast can be running in, and when the ship is unloaded it will have sufficient ballast to enable her immediately to proceed on her voyage."

[Printed, 5½d. Drawings.]

A.D. 1853, August 4.—N° 1820.

**HICKSON, WILLIAM.**—"Improvements in canal and river navigation, and in vessels to be used in such navigation, and in the mode of propelling the same." The invention relates to improvements in the locks of canals or rivers, and also to the transshipment of merchandize, minerals, &c., from canal boats into coasting vessels, or from coasting vessels into canal boats, as may be desired. Also, to an improved mode of propelling and of steering boats or other vessels on canals, &c., by means of an improved propeller "formed with two screws revolving in opposite direc-

" tions, and the pitches, being at opposite angles." These screws can be employed for the purpose of steering, by the speed of one or the other being relaxed, or by both being worked in the same direction, so as to cause the vessel to be easily put about or turned. It is proposed that one canal boat fitted with the improved screw, shall tow one other, or more boats, according to the extent of her power; and that the barge or pontoon boat, employed by the inventor to carry several canal boats within it, shall be fitted with this screw, which shall be driven by the engine in one of the canal boats carried by it. The engine on board the boat, is also to be adapted to work the cranes on shore, or a moveable or other crane upon the boat itself, for the more speedy discharge of the barge's, or her own cargo. Should the barges or pontoon boats be employed for transporting laden railway trucks or other loads, they may be fitted with an engine for propulsion, and for hoisting the loads. The canal boats or railway trucks are to be transferred, together with their cargoes, *en masse* to or from the barge, " by the " single or several combined agencies of a syphon and an hydraulic " apparatus, or by a system of compressing or condensing the air " in conjunction with a series of iron tanks or pontoons." " I " also propose to tranship the cargoes of canal boats into coasting " vessels, and vice versa, where practicable, by elevating the canal " boats and floating them into a dry dock, and running or draw- " ing off the water in the usual manner. Temporary coverings " are then removed from apertures in the bottom of the dry dock, " and the vessel's cargo is passed through such apertures which " correspond to other apertures in the bottom of the vessel. The " coverings are suitably fastened externally, and the apertures " in the bottom of the dock are of a sufficient size to allow the " coverings or plugs to be removed from the apertures in the " bottom of the vessel. The cargo is received into a vessel in a " wet dock or arm provided for that purpose on a lower level " or immediately underneath the dry dock. I propose also " transhipping such cargoes, and loading and unloading such " vessels by a suitable arrangement of archimedian screws and " elevating buckets." The barges or pontoon boats are also to be employed as substitutes for graving docks, for the canal boats.

[Printed, 7½d. Drawings.]

A.D. 1853, August 10.—N<sup>o</sup> 1862.

**MAC SWENY, THOMAS.**—This invention is intended “to obviate the liability of vessels breaking their backs or ‘hogging,’ and to promote the increase of speed by facilitating the use of very long and shallow vessels for navigation.” These objects are obtained “by constructing vessels in two or more rigid parts or sections, which when connected together will constitute a complete vessel, having the usual bow and stern, the parts or sections being so connected as to permit the vessel (the series of sections) to bend or yield in a vertical direction, but not in a horizontal one.” The sections of the vessel are so constructed, that one end of a section shall be just large enough to overlap that end of the next section which connects immediately with it. Stout horizontal bolts or axes are inserted, to hold the sections together, and to constitute the centres on which they move in bending.

[Printed, 5½d. Drawings.]

A.D. 1853, August 18.—N<sup>o</sup> 1929.

**CLOUGH, ROBERT.**—This invention consists in giving “depth and stiffness” to a ship or vessel, by constructing it “with two bilges,” i.e., by making the curvature of the midship sections hollow instead of round, at the turn of the bilge; the ordinary round or convex form being retained, both above and below this height.

[Printed, 8½d. Drawings.]

A.D. 1853, September 5.—N<sup>o</sup> 2042.

**CLARE, JOHN, junior.**—This invention relates, “firstly, to a novel mode of attaching iron plates in erecting structures requiring a skeleton or framework, such as houses, vessels, and the like; and, secondly, to another mode of attaching iron plates to each other without any framework, particularly suitable for such structures or articles as boilers, cylinders, tanks, masts, spars, bowsprits, beams, smoke funnels, and the like.”

The inventor proposes that the iron framework employed in the construction of iron vessels “should consist mainly of longitudinal frames of flat bar iron crossed by vertical frames or ribs about eight feet asunder.” His arrangements are such as to enable

him "to employ ribs and frames conjointly, or either separately, " or to dispense with both, to suit the character of structure required," and also to "avoid the usual method of rivetting on " the outside " of the ship.

This latter object is obtained by flanging the ordinary plates all round, so as to form trays about eight feet long, which trays being placed side by side, or end to end, either with or without the intervention of ribs between them, may be connected together by rivets through the flanges, or through the flanges and the ribs. By this arrangement none of the rivets are seen from the outside of the ship.

The thirty sheets of drawings included in the final specification, show the following applications of these principles, &c.

**Horizontal and vertical T-iron framing.**

Flat bar-iron vertical framing, with trays or flanged plates between them.

A mode of sheathing flanged iron plates with wood, that copper sheathing, &c. may be afterwards brought on. In this case the flanged plates have the flanges turned outwards.

Watertight bulkheads made with flanged plates, and with " grooved T-iron " between the joints of the plates.

A mast formed of a "rolled iron frame" having six radial plates, the spaces between the plates being filled in with wood.

A mode of planking an iron vessel with wood. The framing of the vessel is vertical flat bar-iron, with a head formed inside and outside, to cover the joints of the flanged plates which fit between the ribs. The flanges of the plates are turned inwards, and the wood planking is to be worked outside.

A similar arrangement, with an alteration in the form of the outer edges of the ribs.

A plan of wood sheathing, over iron plates, double flanged, and ribbed.

A plan of vertical grooved iron framing, in combination with the flanged plates.

Flanged plates fluted, and formed with ribs on the inside.

Flanged plates, with a bent bar clasping the flanges, and receiving the rivets.

Plates with horizontal flanges, but with T-iron frames instead of flanges at the vertical joints.

Flanged plates, with bars bent over the vertical flanges, and

turned on the inside of the plates, to take rivets through the plates, as well as through the flanges.

Ribbed and flanged plates riveted at the flanges.

Narrow flanged plates introduced between the broader strakes, to which they are riveted through the flanges.

T-iron bars introduced between the joints of the flanged plates, the rivets passing through the flanges and the bar.

A similar arrangement, but with the double leaves of the T-iron bent round the flanges so as to clasp them, the rivets thus passing through five thicknesses of iron.

Iron plates united by a *tongue and groove* joint, the edges being thickened to admit of it.

A mode of fastening the planking of the decks to the beams. By this mode, the edges of the planks are rabbeted, and short screws are put up, through the angle-irons or flanges of the beams into the plank.

Different plans of iron keels and keelsons. Each length of the keel or keelson consists of a single piece of iron, having one horizontal surface and five vertical webs, the spaces between which, may or may not be filled with timber.

Various modes of making iron masts.

Various kinds of "flanged iron plates for ceilings or other like purposes, with ribs, and packed with timber."

Also modes of constructing water tanks, smoke funnels, boilers, cylindrical cases, and iron houses; and "various forms of rolled bar angular and circular iron."

[Printed, 6s. 0½d. Drawings.]

A.D. 1853, September 10.—Nº 2097.

TRONSON, ROBERT.—"Improvements in ventilating and preventing spontaneous combustion in ships and other vessels laden with coal, culm, or cinders."

"This invention has for its object improvements in a Patent granted to James Meacock on the 12th day of April, 1848, for like objects." It consists in "applying numerous vertical or upright tubes of iron or other suitable material extensively perforated with holes. In loading a ship or vessel these tubes are placed or fixed upright in and rise up above the coal, culm, or cinders, in such manner that any gas or vapour evolved from the same may rise up such tubes to the unfilled space below

the deck, and be removed thence by means of any suitable exhausting apparatus.

[Printed, 2½d. No drawings.]

A.D. 1853, September 17.—N° 2163.

BAKER, ARTHUR JOHN.—(*Provisional protection only.*)—This invention consists in the application of trusses, for the purpose of strengthening wood and iron vessels. "A truss or frame of timber or iron is to be constructed along the centre of the vessel, or two trusses or frames at the sides thereof, with cross trusses to keep the several parts in their place. This framework is to form an addition to be built within vessels of the ordinary construction, and the object is to give stiffness and strength, or may be used as a substitute for part of the present framing. The trusses to be formed in the usual manner with horizontal ties and straining beams and diagonal braces, the whole tied together with bolts and straps."

[Printed, 2½d. No drawings.]

A.D. 1853, September 30.—N° 2237.

JOHNSON, JOHN HENRY.—(*A communication from M. D'Houdetot.*)—The invention relates to an improved mode of conveying life lines over any required object, such as a ship in distress, or a building on fire, for effecting the saving of life and property. It consists in fitting a capsule of caoutchouc, or a combination of caoutchouc with some other material, such as gutta percha, to the muzzle of a cannon or other fire-arm. The cord to be conveyed is attached to this capsule, and is suitably coiled to allow of its being readily run off. On the discharge of the fire-arm, the ball will enter a small chamber in the capsule, and carry it with the end of the life line to the desired object.

[Printed, 5½d. Drawings.]

A.D. 1853, October 1.—N° 2247.

LETESTU, JEAN MARIE.—(*Provisional protection only.*)—This invention has for its object an improvement in the means of propelling vessels. For this purpose the vessel is built with both ends alike, and at each end two cylinders or water passages are fixed below the line of floatation, opening into each other at their ends. In one of these passages a piston works, and "by

“ reason of the two passages being connected at the inner ends  
 “ the water will be forced outwards from one of the passages  
 “ whichever way the piston is moved.” “ In order to give  
 “ greater effect an air vessel is applied to each of the cylinders or  
 “ passages.” The vessel may thus be propelled with either end  
 foremost.

[Printed, 2½d. No drawings.]

A.D. 1853, October 3.—N° 2254.

BAXTER, JOHN WYNOLL.—The invention consists, firstly, in a peculiar formation of the bottoms of vessels. The line for the edge of the rabbet of the keel is to be straight, and inclined downwards “ from about half the height of the stem to the utmost  
 “ depth of the centre or widest part of the vessel,” which is situated at about two-fifths of the vessel’s length from the stem. The bottom of the keel is to be throughout this length parallel to the edge of the rabbet, and thence aft, parallel to the deck. “ The after part of the hull,” the inventor states, “ may be formed  
 “ by a second straight line proceeding from the lowest part of  
 “ the vessel to a point in the stern of the vessel, about two-thirds  
 “ of its depth.” By another arrangement “ the stem may be per-  
 “ pendicular to the deck (or horizontal) line for about half the  
 “ depth of the vessel, which is connected by a short curved line  
 “ to a horizontal keel extending to the middle of the vessel, from  
 “ whence the after part of the bottom may have the usual form.” The width of the after part of the deck is to be two-thirds that of the widest part, and the outline of the deck is to be formed by two circular arcs of large radius on each side.

Secondly, the side timbers or ribs of the vessel are to be portions of circles, “ struck from a common radius,” “ forming a series of  
 “ ovals or gothic arches, conforming to the increasing and decreas-  
 “ ing width of the deck.”

[Printed, 6½d. Drawings.]

A.D. 1853, October 11.—N° 2323.

KEMP, HENRY. — (*Provisional Protection only.*) — Improvements in the preparation of wood for sheathing ships, as a substitute for copper and other metals for preserving the bottom from the adhesion of weeds, barnacles, and other marine insects, &c.; also for house, ship, and pier building, railway sleepers, piles, and other purposes where great durability and strength are required;

and as a preservative against the attacks of various kinds of insects. The wood is to be immersed in a solution of barytes, and then submitted to a high pressure, or what may be sufficient to fill the pores. After this operation it is allowed to become nearly dry, when it is placed in a tank containing sulphate of copper in solution, after which it is dried for use. In some cases after the first process, use is made of a puncturing roller, the spikes of which penetrate to a certain depth, according to the substance of the wood, and the perforations are filled with a chemical compound prepared with arseniate of copper, carbonate of barytes, and red lead, or any other suitable mixture.

[Printed, 2½d. No drawings. See No. 828, (1854) ]

A.D. 1853, October 12.—Nº 2344.

WAITHMAN, ROBERT WILLIAM.—“Improvements in apparatus for applying paint, varnish, and other liquid substances, and also for cleaning carriages, ships, roadways, houses, and other buildings.”

The invention consists in so constructing brushes, mops, brooms, or other such apparatus that paint, varnish, or other such substance, or water or other cleansing matters, may be conveyed to them from any convenient reservoir. This reservoir may be in the handle or other part of the apparatus for paint, &c., but the method to be generally adopted for cleaning, is to connect the article by means of a flexible hose, with a tank or other reservoir containing water, &c., or with a pumping apparatus. By this means the brush is always kept clean, and a pail to contain water for any washing or cleansing operation for which the brush is to be employed, is dispensed with.

[Printed, 4½d. Drawings.]

A.D. 1853, October 13.—Nº 2362.

GRAHAME, THOMAS.—Improvements in building ships and other vessels. These consist, first, in the use of several thin sheets of iron or other plating, instead of single sheets of a greater thickness, such thinner sheets being laid together, and having between them layers or sheets of cork, gutta percha, india-rubber, paper, or other material, to prevent the action of the atmo-

sphere, and to offer a series of elastic flexible fillings between the several sheets of metal, thus obtaining greater strength and power of resistance, with a diminished weight.

Secondly, in the use of ribs or framings of trough iron, instead of the angle or T-iron, now in use in iron, wooden, or other vessels, in the view of obtaining greater strength with diminished weight.

And, thirdly, in covering the bottoms of vessels, whether built of wood or iron, with a smooth vitreous substance or smooth enamel of any kind, to reduce the friction in passing over and through the water.

[Printed, 2½d. No drawings.]

A.D. 1853, October 28.—N° 2499.

THOMPSON, WILLIAM.—(*Provisional Protection only.*)—This invention consists in a means of instantaneously extinguishing conflagrations in ships' holds and other places. A certain quantity of powdered chalk is to be confined in a barrel or box made of metal, or of wood lined with lead foil, and perforated on the upper part. This is to be placed in the hold of the ship, and is to be in communication with the deck, by means of a pipe made of lead, iron, or any other metal, the form of which will be that of a funnel, with a lid affixed to the top, down which is to be poured sulphuric acid in proportion to the quantity of chalk used, which must vary according to the size of the ship.

[Printed, 2½d. No drawings.]

A.D. 1853, November 8.—N° 2592.

PARRATT, GEORGE FREDERICK.—“Improvements in life rafts.” This invention consists in a combination of flexible air and water-tight tubular vessels, made by preference of vulcanized india-rubber, combined with spars, and netting or like open work or fabric, the flexible vessels being strengthened with canvas and netting. For this purpose four or more such vessels are “combined together end to end in such manner that they will form a lozenge-shaped outline of hollow tubes, and they are kept extended to the greatest length by spars fixed thereto, and when out of use the tubular sides will pack close up to the central or longitudinal spars, but when in use a transverse spar or spars

" hold the two sides of the raft to the greatest breadth. The  
 " whole area enclosed by the tubular outline is covered with  
 " netting or open work or fabric, so as to offer holding surfaces  
 " for persons, and yet be open for the free passage of water."

[Printed, 8½d. Drawings.]

A.D. 1853, November 17.—N° 2662.

**CLARE, JOHN, jun.**—"Improvements in the manufacture of bar  
 " and sheet metals, in machinery connected therewith, and in  
 " the application of such metals to various useful purposes."

The "invention relates, firstly, to the manufacture of various  
 " improved forms of angle iron, applicable also to bars of other  
 " metal; secondly, to the forming of peculiar flanges to sheet  
 " metal; thirdly, to the application of such improved forms, re-  
 " bated or otherwise, of bar and sheet metals to the construction  
 " of ships and other vessels, and to various manufacturing pur-  
 " poses; and, fourthly, to the manufacture of the stamping, press-  
 " ing, or rolling machinery for certain parts of such manufacture  
 " of bar and sheet metals."

[Printed, 1s. 0½d. Drawings. See No. 2,042, (1853).]

A.D. 1853, November 22.—N° 2716.

**RAMSAY, CHARLES.**—"Improvements in ships' and other  
 " pumps." According to this invention, a horizontal cylinder or  
 barrel is employed, having a piston worked to and fro therein, by  
 a piston rod put in motion by suitable power and gearing. At  
 each end of the cylinder or barrel, is an opening from the valve-  
 box, for the passage of water into and out of the cylinder, as the  
 piston moves to and fro. This valve-box, which is also in commu-  
 nication with the upper end of the suction pipe, is divided trans-  
 versely into two chambers, one chamber for each end of the barrel.  
 The valves at the upper end of the suction pipe open inwards, and  
 there is a man-hole or covered opening by which they can readily  
 be got at. For the delivery of the water there is also a divided  
 passage from the valve-box, one branch communicating with each  
 end of the barrel, and each branch is closed with a valve opening  
 outwards, so that when either of the branches is not delivering  
 water, it is closed air-tight.

[Printed, 5½d. Drawings.]

A.D. 1853, December 7.—N<sup>o</sup> 2843.

GETTY, JOHN.—(*Provisional Protection only.*)—"This invention  
" relates, firstly, to certain means for facilitating the marking of  
" the holes required to be punched in the plates in the plating of  
" iron ships; and, secondly, to a mode of determining the curve  
" required for plates intended to fit those parts of the vessel where  
" (as at the head and stern) a sharp bend in the lines of the vessel  
" occurs." To avoid hauling up the plate for the purpose of  
marking the holes " I provide frames equal in length to the length  
" or the breadth of the plate to be marked, and sufficiently wide  
" to carry a strip of strained paper or cloth, which will cover a  
" double line of bolt holes. Having applied this frame to a double  
" line of holes in an adjoining plate, I mark on the paper or cloth,  
" with chalk or other material applied through the bolt holes, and  
" where these marks occur I cut out holes in the cloth or paper,  
" and thereby form a template, which will guide me in punching  
" the holes through the plate of iron. In order to ascertain the  
" position of the holes in the metal ribs of the ship, I use a separate  
" frame, or form this frame of a capacity equal to the size of the  
" plate to be fitted. In either case I provide the frame along its  
" length and breadth with fixed or removable pins, and stretch  
" across the frame, and over these pins a chalked string, so as to  
" cut the line of centres of the rows of holes, and then, at right  
" angles to these lines, I stretch a length of chalked string, so as to  
" cut the centres of the individual holes. By pressing, therefore,  
" the intersections of the strings on the plate to be pierced, the  
" centres for the bolt holes will be marked thereon, or in lieu of  
" the frame and paper, I may employ stiff pasteboard or other  
" board capable of receiving studs, which, when the board is  
" applied to the place destined for the pierced plate, are stuck  
" into the board in positions exactly corresponding to the bolt  
" holes in the adjacent plates and ribs, and thus a template is  
" formed, from which an impress of the bolt holes may be made  
" on the plate to be pierced."

" For obtaining the counterpart of the curved form which cer-  
" tain of the plates will require to receive, I employ a reticulated  
" board or plate, somewhat larger than the plate to be shaped,  
" and fit the holes in the board or plate with gauge screws or rods.  
" By applying this apparatus to the ship, and protruding the  
" screws or rods, so that their ends will produce a kind of mould

" that fits the place to be covered, I am enabled to obtain a counterpart of the figure to which the plate is required to be fashioned."

[Printed, 2½d. No drawings.]

A.D. 1853, December 9.—N° 2873.

**BOURNE, JOHN.**—"Improvements in machinery for the production of iron ships and other similar structures." It is proposed instead of punching the plates one by one at the punching press, and rivetting them together at the ship with hand hammers, to use a movable punching and rivetting machine at the vessel, which shall punch and rivet the plates in their places, so that the vessel may be both punched and rivetted on the stocks. This machine is a species of press worked by hydraulic pressure. To carry its weight, a travelling crane is raised over the vessel and travels from stem to stern, either on rails laid along pillars on each side of the vessel, or along the ground. From a beam attached to this travelling crane, the punching and rivetting machine, which is best made of a horse-shoe form, is suspended by trunnions, and through these trunnions the water proceeds which is to work the machine. A small portable engine and boiler is placed upon any convenient part of the travelling crane, and this engine works a pump or pumps of such a construction, as to be adapted for producing a large hydraulic pressure. Such arrangements are made in the apparatus that the press may be raised or lowered, and carried from side to side, and still remain in communication with the pumps. After the machine has punched the portion of work which is ready for it, rivetting dies are introduced into it, and it goes over the same ground again, rivetting up the holes it punched before. Or, since the machine is so balanced upon its trunnions that it will stand in any position, instead of the punching and rivetting being performed by the one machine, two machines may be employed, and the rivetting machine will in such case follow the punching machine at a convenient distance.

The next improvement in the machinery for the production of ships, consists in the use of circular chippers for clipping the edges of the plates, the plates being set upon a swivelling table which may be turned wholly or partially round by appropriate mechanism, by which means any curved or circular outline may be cut. And another improvement consists in the employment of rollers to bend

the angle iron beams, and also the frames. "These rollers are  
" arranged in an iron box in a similar manner to that of the ordinary  
" plate bending rollers, but to give a concave bend, or to com-  
" press the angle iron flange the upper roller is set obliquely, and  
" has a triangular periphery, whereas to give a convex bend or to  
" extend the angle iron flange the rollers lie in parallel planes,  
" and grooves are cut in the two lower rollers for the reception of  
" the flange."

[Printed, 1s. 1½d. Drawings.]

A.D. 1853, December 9.—Nº 2874.

BOURNE, JOHN.—"Improvements in the construction of iron  
" ships." "The main design of the most material of my im-  
" provements in the construction of iron ships is to enable  
" machinery to be applied with greater facility to their manu-  
" facture, and also to give them greater strength in a longitudinal  
" direction." For this purpose, the water-tight bulkheads are  
first got in place, if convenient; and the ribs are placed longi-  
tudinally from bulkhead to bulkhead, instead of transversely.  
The floors are worked in a similar manner between the bulkheads,  
and on them a platform of iron plates is laid, rivetted to them  
and to the ship's sides, so as to form with the outside plating of  
the bottom, a water-tight tubular structure. "In cases in which  
" it is not convenient to raise the water-tight bulkheads into  
" their places in the first instance, I substitute a temporary  
" framework of wood or iron, which is carried up as the plating  
" advances, so as to keep the vessel in shape, and which is after-  
" wards removed, and in cases in which the water-tight bulk-  
" heads are set up in the first instance, I make provision, whereby  
" a marginal plate all round each bulkhead next the skin of the  
" vessel may be removed, to enable the machine which I propose  
" to use for punching and rivetting the plates of the shell"  
(No. 2873) "to pass fore-and-aft from stem to stern without  
" interruption." The beams of the deck are also to run fore-and-  
aft from bulkhead to bulkhead, and are to be covered, either  
wholly or to a great extent, with iron plates, rivetted together,  
upon which the ordinary wooden deck is to be laid down. "The  
" bolts which connect the wooden deck to the iron plating  
" beneath it are iron deck screws passing upwards from  
" below, as is the usual practice, but I make the necks of the

“ whole of these bolts conical, so that when the bolt is screwed  
 “ into the wood, the neck will jam itself in the hole in the iron  
 “ beam or iron plate, and thereby prevent any working between  
 “ the iron and the wood. In some cases I finish the hull of the  
 “ ship without introducing ribs, either horizontal or vertical, and  
 “ I afterwards introduce such ribs, whether horizontal or vertical,  
 “ as may be required, rivetting them securely to the outside  
 “ plating in the usual manner. Finally, in constructing screw  
 “ vessels, I make the frame at the stern, for the reception of the  
 “ screw, in one piece, as is the usual practice, but I add to this  
 “ frame, at its upper and foremost corner, a broad palm, like the  
 “ palm of a vice, and I introduce a horizontal breast hook plate  
 “ at the stern, which is rivetted to the sides of the ship, and to  
 “ which this palm is also rivetted.”

[Printed, 8½d. Drawings.]

A.D. 1853, December 15.—N<sup>o</sup> 2906.

MESSENGER, SAMUEL.—“ An improvement or improvements  
 “ in railway, ship, and carriage lamps.” This improvement  
 consists in the application of corrugated plates or sheets of metal,  
 to the construction of parts of railway, ship, and carriage lamps,  
 for the purpose of strengthening them.

[Printed, 5½d. Drawings.]

A.D. 1853, December 16.—N<sup>o</sup> 2923.

MÉDAIL, ALPHONSE.—An improved hydraulic machine for  
 “ raising and discharging water from the holds of ships and other  
 “ vessels, in place of the pumps ordinarily employed,” and for  
 other purposes.

This machine acts by means of centrifugal force, and is constructed as follows: it is “ of a conical form, and is composed of a  
 “ series of cones of sheet iron or other suitable material arranged  
 one inside the other, being separated and kept asunder in their  
 “ respective positions by means of vertical partitions. The inner-  
 most cone is closed at top and bottom by means of a casting, by  
 “ which means also the whole machine is connected to a central  
 vertical shaft. The other cones are all open at the bottom and  
 “ rise by gradation, the innermost cone being the lowest, and the  
 outermost one being the highest. Each cone is provided at top  
 “ with an internal flanche projecting horizontally over the space

“ between it and the next cone, the space at the top of the cones  
“ thus forming (as it were) a bason, the bottom of which is formed  
“ by the top of the innermost cone.

“ The machine is enclosed at the top by means of a cover of  
“ sheet iron or other suitable material closely united to the outer  
“ cone, and provided at the centre with an opening, to which a  
“ vertical tube is adapted. The tube revolves with the machine,  
“ and is furnished at its upper extremity with a reservoir or cistern  
“ into which the water or other fluid is discharged. The vertical  
“ shaft which supports the whole machine is mounted in suitable  
“ bearings at top and bottom, and is caused to revolve by means  
“ of any suitable mechanism. Another mode of constructing the  
“ upper part of the above machine is as follows: instead of  
“ enclosing the top of the machine by means of a plate it is left  
“ open, and to the upper edge of the outer cone a cylinder (also of  
“ sheet iron or other suitable material) is attached by means of a  
“ flanche. The interior of the cylinder is furnished with a worm  
“ or spiral rim projecting internally,” and the upper extremity of  
the cylinder communicates with a reservoir or cistern.

[Printed, 10½d. Drawings.]

A.D. 1853, December 20.—N<sup>o</sup> 2962.

BURROWS, JAMES.—“ Certain improvements in the formation  
“ of such metallic plates as are required to be conjoined by  
“ rivetting or other suitable fastening.” The invention applies  
chiefly to the formation of what are technically termed “lap  
“ joints,” and consists in forming the edges, or those parts of the  
plates where the holes are to be formed, thicker or stronger in  
substance than the body of the plate, in order that when the holes  
are formed in them, those portions of the plates shall remain as  
strong as the rest of the plates.

[Printed, 6½d. Drawings.]

A.D. 1853, December 20.—N<sup>o</sup> 2964.

THOMSON, ARCHIBALD.—This invention relates to “an im-  
“ proved arrangement of an adjustable template for setting out  
“ and marking the rivet holes in iron plates used in the construc-  
“ tion of iron ships, boats, boilers, and other vessels. This tem-  
“ plate may be made of wood or plate iron, but the latter material  
“ is preferable, as it may be bent without injury when necessary.

“ When the instrument is intended for the iron plates forming  
“ a ship’s side, it consists of top and bottom parallel horizontal  
“ side plates, each side being made up of a number of lengths  
“ jointed together by means of small slots and screw pins. Each  
“ of these lengths corresponds to about the horizontal distance  
“ between two adjacent ship frames or ribs, but the slot jointed  
“ affords a means of increasing or diminishing the entire length of  
“ the side to suit various distances apart of the frames. These top  
“ and bottom plates are pierced with one or two rows of holes cor-  
“ responding to the rivet holes to be made in the top and bottom  
“ sides of the iron plate. The top and bottom plates are con-  
“ nected by vertical cross plates corresponding in number and  
“ position to the frames which occur in the extent of the plate for  
“ which the template is to be adjusted. The vertical cross plates  
“ are united to the horizontal top and bottom plates by slots and  
“ screw pins, and can be adjusted to different widths of plate.  
“ They serve chiefly to carry a series of short template pieces for  
“ marking the rivet or bolt holes on the ship frames. Each of  
“ these pieces is adjusted by screw pins at one end in a slot on  
“ the vertical cross plate, whilst the other end has a hole for  
“ marking the bolt hole on the plate, and the piece may be set  
“ obliquely if necessary.”

When all the parts of the template are adjusted upon the ship’s side, one or more diagonally disposed plates may be screwed upon it to preserve the angle of the various parts, if the friction of the several joint screws is not sufficient for the purpose.

[Printed, &c. Drawings.]

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1854.

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A.D. 1854, January 23.—N° 166.

GETTY, JOHN.—*Letters Patent void for want of final specification*.—“ This invention relates, firstly, to certain means for  
“ facilitating the marking of the parts for the bolt-holes in the  
“ plates employed in constructing tubular bridges; and, secondly,  
“ to a mode of determining the shape to which plates, whether  
“ employed in constructing bridges, ships boilers, or other metal

“ work are required to be cut to fit the space which they are  
“ destined to occupy.”

The inventor proposes to take a light frame somewhat larger than the plates to be used, and to stretch upon it a sheet of paper or cloth or other similar substance, suitable for receiving marks made with a piece of chalk, applied through the bolt holes; so that holes being cut in the sheet where the marks occur, a template may be formed. Besides marking the situations of the bolt holes, he draws the shape required for the plate, and cuts the paper or other material to the lines.

[Printed, 3*d*. No drawings.]

A.D. 1854, January 28.—N<sup>o</sup> 215.

BETHUNE, DONALD.—“Improvements in the construction of  
“ vessels propelled by steam or other motive power.” “This in-  
“ vention consists in a new and peculiar mode of constructing  
“ ships so as to give to them greater strength amidship, or, in  
“ other words, at the part where the greatest strain takes place,  
“ and which part in ships as hitherto constructed is usually the  
“ weakest, particularly in vessels propelled by paddle wheels placed  
“ at the sides thereof.”

“And further, by this invention I am enabled to build ships of  
“ greater length in proportion to the width of beam than hereto-  
“ fore. And by strengthening the sides of the ship I am enabled  
“ to employ paddle wheels of considerably larger diameter, by  
“ which in combination with greater length I obtain greater  
“ speed.”

These improvements are to be effected by raising the topsides amidships to about ten feet above the main deck, and forming a trussed arch in the sheer. These raised topsides are to be connected by iron beams, on which a short upper deck may be laid.

[Printed, 10*d*. Drawings.]

A.D. 1854, February 1.—N<sup>o</sup> 253.

ROBINSON, ALBERT.—The invention consists in the application of a complete covering of black lead or plumbago to the bottoms of iron or wooden ships and vessels, and other surfaces. For this purpose, the plumbago is combined with sufficient quantities of  
“ gums, fatty, resinous, or waxy matters, gutta percha, caoutchouc,  
“ or other plastic, or easily fusible mediums.” The composition

thus formed is to be applied in a melted state to the bottoms of ships or other surfaces, and is, when cold, to be polished or burnished by rubbers, so as to produce a perfectly smooth and even surface of polished black lead. And in order to prevent the attachment of marine animals and plants to this polished surface, some poisonous and irritating substances are employed, "such as the  
 " oxides and sulphurets of arsenic, the combination of its oxides  
 " with the oxides of lead and copper, or these latter oxides alone,  
 " carbonate of barytes, the oil of croton, tigllium, or other poison  
 " applicable to the purpose."

[Printed, 3d. No drawings.]

A.D. 1854, February 4.—N<sup>o</sup> 277.

**MILLS, GEORGE.**—"Improvements in the construction of steam  
 " vessels, and in steering the same." The invention consists "in  
 " constructing such vessels as twin vessels with straight inner  
 " sides fixed at a suitable distance from each other, with a water-  
 " way between them in which the propeller may be made to work."  
 " The twin vessels may be united either by means of strong braces  
 " or stays, or by a continuous or intermittent flooring, stretching  
 " from the one to the other under water, at or near the keel or  
 " the bottom of the vessel."

Also in adapting and applying to such vessels, paddle wheels, to be worked at right angles, or nearly so, to the line of the keel, for the purpose of steering or manœuvring them. These paddle wheels may be worked either from the prime mover of the vessel, or by means of separate power applied thereto.

[Printed, 6d. Drawings.]

A.D. 1854, February 11.—N<sup>o</sup> 338.

**GETTY, JOHN.**—(*Provisional Protection only.*)—"An improved  
 " mode of plating iron vessels." It is proposed, first, to cover the ribs of the vessel with plates, "arranged so as to break joint,  
 " and having their edges brought flush together so as to form  
 " butt joints." On this covering of plates (which are attached to the ribs by fastenings just sufficient to retain them in place) another set of plates is to be wrought, breaking joint with the plates already attached, and bolt holes being punched in the two sets of plates, corresponding to the lines of bolt holes in the ribs, bolts are passed through the three thicknesses of metal.

Three, or even more layers of plates, may be employed and secured in position, as described.

[Printed, 3d. No drawings.]

A.D. 1854, February 24.—N° 445.

VALLETTE, DÉSIRÉ.—(*Provisional Protection refused.*)—"The  
" imitating and ornamenting of wood by means of a new process,  
" consisting of a paste to be applied to furniture generally, pan-  
" nelings either for the interior decoration of houses or ships,  
" frames, mouldings, doors, and, indeed, all that may be con-  
" sidered ornamental wood work; this paste may also be applied  
" upon zinc and iron in every state." "This composition is  
" capable of receiving every possible tint or colour, mahogany,  
" citron wood, palissander, ebony, old oak, &c., &c. It is com-  
" posed of glue (*colle de peau ou de Flandres*), whitening, lamp  
" black (or almost any sort of black), and English cement. The  
" different colours are applied in a paste upon the wood, and by  
" means of a mould the form, model, or contour desired can be  
" easily obtained."

[Printed, 3d. No drawings.]

A.D. 1854, February 25.—N° 464.

LAMPORT, CHARLES.—"Improvements in machinery used in  
" ship building." "In preparing the frame of a ship about to be  
" built, the usual mode of proceeding is to shape and bevil the  
" timber composing the frame as near as possible to what is re-  
" quired to give the ship her proposed form, both vertically and  
" longitudinally, when on the ground, and by manual labour.  
" When the frames are erected in their places, any irregularities  
" arising from error or straining are adzed away, and the said  
" frames dressed or flattened to receive each plank. In place of  
" finishing them as above by hand, I rough the timbers out by  
" axe or saw, and in this state put the frames together, and when  
" in place reduce them to the curves and bevils (marked on each  
" from the moulds in the ordinary way), by the employment of  
" revolving cutters or planing irons, set in motion by steam or  
" other motive power. For this purpose I employ the ordinary  
" railway for a travelling crane to run the whole length of the

“ slip on which the ship is to be built. Upon and pendant from  
“ the transverse carriage I have a moveable frame to sustain the  
“ pulleys, shafts, wheels, and apparatus necessary to give motion  
“ to the cutters, which are so arranged as to move up and down  
“ within or upon the said pendant frame, to adjust them to the  
“ height upon the frame of the ship as may be required, while the  
“ travelling carriage will carry the frame along the ship's side, as  
“ required. I communicate motion to the pulleys and cutters by  
“ means of shafts or continuous bands, either at the level of the  
“ railway, or at any advisable height upon the pendant frame, and  
“ capable of being raised or lowered as required. I also employ  
“ the machinery to bore the bolt and treenail holes in the frames  
“ and planks of the ship, by the substitution of centre bits,  
“ augers, or other borers in place of the cutters. I further employ  
“ the machinery to dress and plane the planks when on the ship;  
“ also the stanchions, bulwarks, and other parts, and to mould  
“ the rails, gunwales, and other parts, and to plane or fair the  
“ flat of the deck. And I use the same machinery to bore the  
“ holes in the plates and angle irons, and other parts of iron  
“ ships, when in place, so as to ensure the exact coincidence of  
“ the several holes in the different parts.”

[Printed, 10d. Drawings.]

A.D. 1854, March 16.—N<sup>o</sup> 630.

**BETHUNE, DONALD.**—“ Improvements in the construction of  
“ vessels propelled by steam.” The invention applies more par-  
ticularly to vessels constructed upon the principle stated in a former  
Specification, No. 215, of 1854, in which said Specification a method  
is set forth “ of constructing vessels with shallow holds, but of  
“ considerably greater length from stem to stern than vessels  
“ as previously constructed.” The intention of the present in-  
vention is to give additional strength to the vessel, by constructing  
the hold thereof in the form of cells or separate compartments  
communicating with each other, and so to stow the fuel required  
for generating the motive power in such vessels within these cells,  
that the rolling and pitching motion in heavy seas, or when under  
heavy press of canvass, cannot materially alter the position of the  
entire mass of fuel.

[Printed, 9d. Drawings.]

A.D. 1854, March 20.—N° 654.

**MOORE, HENRY.**—(*Provisional Protection only*).—“An improved template for facilitating the building of iron ships and vessels.” This invention consists in the employment of a template, formed of strips of sheet iron or copper, or of any other pliable material, and having two horizontal bars to serve for marking the holes in the adjacent strakes, and several middle cross bars corresponding with the ships’ frames, for marking the holes contained therein. “The size of the template may be adjusted by the holes in the middle or cross bars, or separate templates may be used for each breadth.”

[Printed, 8d. Drawing.]

A.D. 1854, March 20.—N° 657.

**HORTON, JOSEPH, and POLGLASE, RICHARD JENKIN.**—“Improvements in the construction of ships, boilers, girders, tanks, gasometers, and other like structures or vessels.” The invention consists in giving a peculiar six-sided form to iron plates, by the employment of which, vessels, boilers, and other like structures may be constructed, capable of bearing a greater strain without rupture, than could be sustained by similar structures manufactured with ordinary four-sided boiler plates.

“The figure of our improved iron plate or boiler plate would be represented by taking a plate measuring two feet by two feet, with its surface marked into four equal portions of one foot square each, and then cutting away one square foot, thus leaving a plate of only three feet superficial measurement. In like manner if a plate measuring three feet by two feet be marked out into two rows of three squares each, measuring one foot each, then if two of those squares adjoining be cut away from one of the rows of three squares, the remaining plate will also be of a suitable figure for our purpose.”

“By our said improvement not only do we avoid the usual continuous lines of rivetting, but we also, in the longitudinal strain and the transverse strain, divide such strain by the solid intervening plate in a manner that cannot be obtained when plates of the usual parallelogramic figure are employed.”

[Printed, 6d. Drawings.]

A.D. 1854, March 24.—N° 690.

**MONTGOMERY, RICHARD.**—"A new and useful improvement  
" in corrugated metals, and in machinery for producing the  
" same." The invention consists firstly, "in making plates of  
" metal applicable to steam boilers and other purposes, plain on  
" their margins and corrugated within, the corrugated part being  
" thinner than the margin. It also consists of rolls of a peculiar  
" construction for producing these corrugated plates from plain  
" sheets or plates, and for bending and arching them when neces-  
" sary."

And, secondly, "in machinery for corrugating plates of metal  
" into beams suitable for houses, bridges, ships, &c., in which  
" machinery the plate is passed a number of times through a pair  
" of grooved rolls and a stationary crimping die, by which the  
" folds of the beam are gradually brought to the proper depth,  
" without endangering rupture of the metal, which is unavoidable  
" when the corrugation of folds of any considerable depth is  
" effected by rollers alone."

[Printed, 11d. Drawings.]

A.D. 1854, March 28.—N° 712.

**WOODWARD, JOHN.**—(*Provisional Protection only.*)—"Certain  
" apparatus for stopping shot and other holes in ships and vessels."  
The invention consists in "a peculiar apparatus, the head of which  
" is thrust through or into the hole from the inside of the ship,  
" when a spring is caused to act upon and throw out two or more  
" arms, which have been previously covered with leather, gutta-  
" percha, or other like suitable material, somewhat after the  
" manner in which an umbrella covering is mounted upon its  
" frame. The leather covering fits close to the vessel's side, and  
" the outer ends of the arms, ribs, or frames are made to lie upon  
" and embrace the vessel's side by means of a stretcher, mounted  
" upon a screwed shaft, upon the upper part of which the inner  
" ends of the arms are hinged. The stretcher is forced down  
" against the arms by means of a nut."

[Printed, 3d. No drawings.]

A.D. 1854, April 8.—N° 828.

**KEMP, HENRY.**—The improvements relate to "the preparation  
" of wood to be subsequently employed or used for various pur-

“ poses, as for planking or sheathing of ships and vessels, thereby  
“ rendering the bottoms or surfaces of such ships or vessels more  
“ effectually protected or preserved from the adhesion of weeds,  
“ barnacles, crustacea, and all kinds of aquatic insects to which  
“ they may be exposed; the wood is also rendered more durable  
“ by such preparation.”

The operation consists in forcing into the pores of the wood a solution of prepared sulphate of barytes, and a solution of sulphate of copper; and also in the injection of a chemical compound composed of arseniate of copper, sulphuret of arsenic, carbonate of barytes, oxide of copper, and red lead. For the purpose of facilitating such injection, the surfaces of the wood are to be punctured by rollers.

[Printed, 6d. Drawings. See No. 2,323, (1853).]

A.D. 1854, April 11.—N<sup>o</sup> 855.

JAMES, WILLIAM HENRY.—“These improvements consist of  
“ certain variations, additions to, and new applications of, an im-  
“ proved and peculiar method of constructing cellular plates and  
“ vessels, as originally described by me in the Specification of  
“ certain Letters Patent granted to me for the manufacture of  
“ plates and vessels for heating purposes, dated the 25th July  
“ 1845, and also referred to in subsequent Letters Patent, also  
“ obtained by me, for heating and refrigerating, dated 3rd day of  
“ September 1852.”

The variations and improvements consist, in binding together by dovetailed partitions any number of plates placed one above another; such plates being formed with corresponding projections and grooves both on their upper and under surfaces, so as to form cellular or vesicular structures of any required form, capacity, or magnitude; also in certain additional methods of uniting the surfaces of such plates together, without the necessity of their being perforated.

It is proposed to employ these conformations, formed by rolling, grooving, dovetailing, rabbeting, indenting, stamping, and otherwise, in the construction of “the hulls, compartments, and apart-  
“ ments, masts and keels, beams, rafters, floors, and other parts  
“ of steam vessels, sailing vessels, boats, barges, pontoons, rafts,  
“ or other floating bodies, for the purpose of imparting great

" strength thereto as well as buoyancy, by their forming series of  
 " independent dovetailed water-tight partitions, known to be so  
 " useful in case of leakage, fire, or other casualties."

It is also proposed to cast the keels of vessels "in parts, the  
 " cells of which several parts may be united together by tubes so  
 " as to form cellular reservoirs of immense strength for containing  
 " compressed air or gases for various useful purposes, or to serve  
 " as condensers for steam or for other purposes."

[Printed, 8d. No drawings.]

A.D. 1854, April 29.—N° 968.

**VARLET, JEAN PHILIPPE.**—(*Provisional Protection only.*)—  
 " Improvements in obstructing the holes produced by accidents  
 " or projectiles in the hulls of ships and boats." "I construct a  
 " flexible case or shell of waterproof cloth, caoutchouc, gutta  
 " percha, or other waterproof substance, which is passed under  
 " the damaged ship or boat and drawn up by ropes or otherwise,  
 " so as to envelope the hull of the vessel and prevent the entrance  
 " of water at the holes. In lieu of the complete case or shell, I  
 " sometimes apply elastic and extensible bands to the sides of the  
 " vessels below the water line, and when the side of any such  
 " vessel is perforated by a cannon ball or otherwise, I draw up  
 " the adjoining band or part of the band by means of ropes, so as  
 " to extend it and cause it to cover the hole. A metallic plate  
 " may be interposed between the band and the side of the vessel  
 " if desired."

[Printed, 8d. No drawings.]

A.D. 1854, May 5.—N° 1019.

**WARNER, ARTHUR.**—"The invention consists of coating sheets  
 " of zinc previously coated with tin or lead with sheets of  
 " copper or its alloys, thus producing sheets of metal very suitable  
 " for sheathing as well as for other uses, each sheet having one  
 " surface of coated zinc, and the other of copper or alloyed  
 " copper."

[Printed, 8d. No drawings.]

A.D. 1854, May 6.—N° 1020.

**ALMY, RALPH.**—(*Provisional Protection only.*)—This in-  
 " vents in preparing a sort of cloth, by immersing it in a

combination of vegetable and mineral substances, so that the fumes generated by its combustion may extinguish flames “in steamers, vessels, houses, and buildings of all descriptions.”

[Printed, 3d. No drawings.]

A.D. 1854, May 8.—N<sup>o</sup> 1028.

LOGAN, GEORGE FOX.—(*Provisional Protection only.*)—“This invention relates to an apparatus to be employed for facilitating the construction of iron ships, boilers, and other metallic structures, by furnishing a ready and correct means of setting out and marking off the situations of the rivet or bolt holes in the plates and frames, and the exact shape of the plates used in works of this nature.”

The apparatus consists of an open rectangular frame of metal or other material, composed of bars suitably slotted longitudinally, to admit of the necessary shifts and adjustments during use. A main central bar forms the stop or fixed point of resistance for the shift of the other pieces, and two narrow outside bars are connected to this central bar by means of “two or more sets of reversed adjusting screw spindles.”

By making these external bars adjustable and flexible, any required degree of curvature can be given to them in the direction of the plane of the frame, by setting the transverse screw spindles accordingly. “The slots throughout the frame afford a means of attaching any necessary marking pieces. Such an apparatus is what may be termed ‘universal,’ since it will answer for all classes of work, and all pitches of frames and rivets,” by the adjustment of its details. Any lateral curvature may also be given to the frame by bending the flat transverse pieces to the required form. “This gives the workman the exact positions for his rivet holes, either on a concave or convex surface, a point which is impracticable with the common inflexible frame.”

[Printed, 3d. No drawings.]

A.D. 1854, May 8.—N<sup>o</sup> 1032.

NORMAND, CHARLES BENJAMIN.—This invention relates, first, to “a new arrangement of saw-mill intended to saw out timber through straight cuts or in slight regular curves, by which I mean arcs of circles of a large radius. The saw frame has its motion in a horizontal direction, the saw blades of

" course working in horizontal planes, as in the arrangement  
" patented by me on the 27th October 1852, but the piece of  
" timber, instead of gliding over a smooth and straight floor, is  
" fixed by dogs at its under part to a flexible bed, which is made  
" to travel under the saws, and is borne on a set of parallel rollers.  
" One of the horizontal braces of the saw frame (which in ordi-  
" nary saw mills would stand in a vertical position) moves under  
" the bed, to which the log of timber is affixed; the other brace  
" has its motion over and clear of the said log. 'The lower of the  
" saw blades is set at such a height that it works clear of the  
" heads of the dogs which bind the pieces of timber to the bed."

An important advantage, which is obtained by this mode of presenting timber to the saw (whether for the purpose of making straight or curved cuts) is, that the action of sawing is rendered continuous, that is, it is not requisite to suspend the operation for the purpose of shifting the dogs or holdfasts out of the way of the saw blades. The timber may be cut from end to end by the uninterrupted action of the saws, and requires, during the operation, little or no attendance. "The bearings carrying the rollers, over which the flexible bed advances, are so constructed as to admit of the rollers being set at variable heights, to suit the cut desired to be made, whether it be in a straight line or take the arc of a circle. When all the rollers have been set in the positions corresponding to the curve or straight line in which the piece of timber is to be severed, the flexible bed, by its own weight and that of the piece of timber laid upon it, naturally takes the shape required; both being then securely bound together, they cannot but advance to the saws in the exact direction intended. The reciprocating motion is given to the saw frame by the usual arrangement of connecting rod, fly-wheel, &c., which may be varied and needs no description. The feed motion is given to the bed by racks, pinions, &c., or by any other ordinary mode. If the work to be performed does not include curve sawing, and requires, moreover, a high degree of accuracy, the flexible bed might be superseded by a rigid bed of cast-iron, moving on slides, as the bed plate of a common planing machine for working metals."

The invention relates, secondly, "to a mode of reducing the amount of power necessary to perform mechanical sawing, and at the same time diminishing the wear of the saws and of the

“ whole machine, and the labor and expense consequent on their  
“ maintenance in good order. This I propose to effect by giving  
“ the saw blades a curvilinear or rocking motion, similar to that  
“ naturally imparted by the pit sawyers; and for this purpose I  
“ connect the saw frame at its opposite ends with rocking frames,  
“ the centres of motion of which are set nearer together than the  
“ points of junction of the saw frame and these rocking frames;  
“ when, therefore, a reciprocating motion is imparted to the saw  
“ frame, the blades will produce a cut in imitation of hand saw-  
“ ing. This contrivance I propose to adapt to the arrangement  
“ of saw frame above described, and also, if required, to other  
“ arrangements of machinery for sawing wood.”

[Printed, 1s. 4d. Drawings.]

A.D. 1854, May 12.—N<sup>o</sup> 1058.

NIXON, CHRISTOPHER NUGENT.—The invention consists of certain modes of attaching rudders with straight heads to floating vessels, and is designed for the purpose of enabling such rudders to be more readily shipped and unshipped when necessary; and also to admit of their rising on coming in contact with any obstacle upon which they may accidentally strike.

Firstly, as regards ships. A groove or socket is formed on the face of the stern post, with a narrow mouth or opening in front. This groove or socket may either be formed entire from the top to the bottom, or it may be divided into two or more sections or parts. Into the groove or socket a bar or rod of metal of similar form thereto is fitted, which bar, when attached to the said groove or socket, forms a hinge for the rudder to turn upon, and to slide up and down, and thus admits of the rudder being readily shipped and unshipped. Or, instead of having a groove in the face of the stern post, an elongated spanner or clip may be attached to the hinge of the rudder, capable of sliding up and down the stern post, either in grooves or upon flanges fixed to or formed thereon; the said spanner or clip being in one or more sections or parts, as in the case of the sockets before mentioned.

Secondly, as regards smaller vessels. Instead of hinging the rudder to a sliding bar, or to a sliding groove, or to spanners, a bar, rod, or pin is attached to the rudder “by means of grooves and “tongues, feathers or clips,” placed at the top, the bottom, and the middle of the said bar, rod, or pin, leaving intermediate openings

or spaces between them and the back of the rudder, to enable the sides and edges of the grooves which are on the stern-post of the vessel, to pass freely around the aforesaid bar rod or pin, when the rudder is in action. Grooves or sockets similar to those before mentioned are also formed, but with intermediate openings or spaces between them, for the tongues or clips of the bar which is attached to the rudder, to pass freely round when the rudder is in action, taking care to leave sufficient space between the tongues or clips of the said bar and the grooves or sockets, to allow the rudder to be partially raised, or to be entirely raised when it is required to be unshipped. If desirable, the bar rod or pin above mentioned may be made fast to the stern-post, and the grooves or sockets be attached to the rudder; in either case the bottom of the said bar, rod, or pin, can be let into a spur or projecting piece at the bottom of the keel of the vessel.

Thirdly, as regards boats. It is proposed to proceed in a similar manner to that lastly above stated, observing that by the above mode of letting the bar or hinge-pin into the spur of the keel of the boat, and securing the said pin at the top by a sliding bar and ring, or other similar and suitable contrivance, and by an eye and straps fixed near the bottom thereof, and by attaching hinge sockets to the rudder, similar facilities are obtained to those above mentioned for raising and lowering the rudder.

[Printed, 16d. Drawings.]

A.D. 1854, May 17.—N° 1097.

**RABIER, JEAN MARIE.**—(*Provisional Protection only.*)—The improvements consist “in building ships and vessels with a flat  
“ bottom, along which runs a keel, which is hinged longitudinally  
“ to the bottom. By means of some suitable apparatus placed  
“ inside the vessel, this moveable keel is placed either vertical to  
“ the flat surface of the ship’s bottom, or it is turned down upon  
“ the same and laid parallel or flat on it. The keel is kept firm  
“ on the ship’s bottom, in the vertical or parallel position to it, by  
“ means of another apparatus placed inside the vessel. Thus,  
“ without altering the cargo and stowage of the vessel, it may be  
“ made to sail in both deep and shallow water.”

The inventor also proposes to fix tubes in different parts of the vessel, each containing a float, to indicate the draught and load of the vessel.

[Printed, 3d. No drawings.]

A.D. 1854, May 18.—N° 1116.

CUNNINGHAM, JOHN, and ASHLEY, WILLIAM.—“This invention relates to a mode of distributing pure or disinfecting air to the various parts of a ship requiring ventilation.” For this purpose air trunks are provided, suitably arranged for conveying air to lateral or branch pipes, in connection with the various cabins and berths, and air is supplied to these main trunks by means of suitable fans or blowers, driven by motive power machinery. For cooling or purifying the air the following contrivance is adopted. In a chamber, which is supplied with cold water or a disinfecting fluid (as chloride of lime in solution), a vertical spindle is mounted, for the purpose of carrying a hollow vessel, closed at top but open at bottom, and provided on its inner periphery with feathers or blades. This vessel dips into the liquid in the chamber, and is intended to lift and discharge it by centrifugal force into the chamber, in the form of spray, through perforations made in the upper part of the vessel. Openings are made in the sides of this chamber for the admission of air, and the upper part of the chamber is connected, by tubes or otherwise, with the casings enclosing the fans or blowers. Of these it is preferred to have a pair, and to mount them on the crank shaft of the engine; rotatory motion is communicated from the engine to the spindle of the lifting vessel, and the liquid in the chamber is thus caused to rise and fall again in the form of spray. Simultaneously with this action, air is drawn into the chamber by the fans, and brought into contact with the spray on its passage to the fans. By this means the air may be cooled, or may have disinfecting properties imparted to it. For the purpose of heating the air in cold weather, it is proposed to insert steam pipes in the air trunks, so that as the air passes through the trunks, it may take up the desired quantity of caloric.

[Printed, 1s. 4d. Drawings.]

A.D. 1854, May 31.—N° 1204.

KENT, JOHN.—(*Provisional Protection only.*)—The invention consists “in the under-mentioned forms for the sides, bottom, and ends of harbour and river boats, and other floating vessels, and also for paddle-box boats, viz.:—I make the bottom and ends of the said vessels flat, with a slight angle along the centre, or otherwise with a curve longitudinally. I make the middle part

“ of the bottom straight, and form the ends in curves tangent  
 “ therewith, by continuing the flat bottom up to the gunwale at  
 “ each end. The sides of the said vessels I also make flat,  
 “ straight, and parallel with each other at the bottom, and curved  
 “ at the gunwale. The curved line at the gunwale dies in to  
 “ the straight line at the bottom where the sides are parallel.”

[Printed, 8d. No drawings.]

A.D. 1854, June 2.—N° 1224.

ALDBOROUGH, BENJAMIN O'NEALE, Earl of Stratford.—

“ Improvements in locomotion on land and water, part or parts  
 “ of which are applicable to the raising of weights and the working  
 “ of machinery.’ The improvements relate, first, to the adapta-  
 “ tion of wings, and also of a winged aerostat or balloon “ to the  
 “ navigation of the ocean, and of lakes and rivers, and also to  
 “ locomotion generally, whether on water or land or upon ice.  
 “ The aerostat may be inflated either with atmospheric air or with  
 “ gas, but I consider that atmospheric air will be found most  
 “ suitable generally; and I prefer furnishing it with a vacuum  
 “ chamber or chambers, and also with a medium chamber, but these  
 “ are not absolutely necessary; the external air being made to act  
 “ forcibly against such part or parts of the surface or surfaces of  
 “ the vacuum chamber or chambers or of the aerostat as may be  
 “ suitable, according to circumstances, by the action of the wings.”

Secondly, to the forms of the hulls of vessels for the navigation  
 of the water, and the parts immediately connected with them; and  
 to an improved form of propeller acting the part of a rudder. The  
 vessel consists of two hulls exactly equal to each other, formed in  
 the ordinary manner, with this exception, that there is no cut-  
 water. They are united at bottom by planks which form the sides  
 of a channel or water passage. This channel is to be of a concave  
 or arched form, but the sides may be inclined planes, which may  
 either form an angle at top, or the upper part may be either flat  
 or curved. “ I prefer adding two keels, which I place as far  
 “ removed as possible from the centre of the channel, so as to  
 “ leave the channel as wide as possible; these keels cannot, how-  
 “ ever, be continued suitably very far aft of the greatest breadth  
 “ of beam.” The vessel is intended to be propelled either on the  
 water or on ice, and the keels are so formed that they may be  
 made to serve as runners, when the vessel is propelled on the ice

by the action of the wings; and “ I consider that by the action  
 “ of the wings, when they are made to strike the air as much as  
 “ possible in a downward direction, and worked with their full  
 “ force, the air being at the same time exhausted from the vacuum  
 “ chambers, or as nearly so as may be found necessary, and the air  
 “ being rarefied by heat, as far as may be necessary or suitable, in  
 “ the upper and fore part of the aerostat, and in those parts of the  
 “ wings which are inflated, (a part of the cargo or stores being  
 “ removed if this should be found necessary,) the vessel may be  
 “ made to slide upwards from the water on the ice when required  
 “ to do so, either for the purpose of attacking a fortress on an  
 “ enemy’s coast in northern latitudes during the winter season,  
 “ or before the breaking up of the ice, or for the purposes of  
 “ scientific discovery at the North Pole or in the regions of  
 “ perpetual ice, or for any other purpose.”

The elastic propeller, which also performs the office of a rudder,  
 “ is formed of planks of elastic wood, combined with steel or with  
 “ vulcanized india-rubber, or both, or with any suitable elastic  
 “ material, to increase its elastic force.”

[Printed, 1s. 10d. Drawings.]

A.D. 1854, June 8.—N<sup>o</sup> 1262.

WILSON, JOHN.—“ An improved pump, applicable to mines,  
 “ wells, ships, fountains, and domestic purposes, and raising  
 “ melted metals in foundaries, so constructed that it cannot lose  
 “ water, draw grit, draw air, or freeze.” This is a force pump,  
 consisting of two barrels and an air chamber between them, the  
 whole of them immersed in the fluid to be raised. The fluid has  
 access to the barrels by valves in their bottoms, so that they fill  
 as the pistons ascend, by reason of the weight of the fluid sur-  
 rounding them. There are two valves to the bottom of the air  
 vessel for admitting the fluid forced downward by the pistons, and  
 a vertical pipe leading from the air vessel conducts the fluid to the  
 required height.

[Printed, 6d. Drawings.]

A.D. 1854, June 20.—N<sup>o</sup> 1345.

STEPHEN, ALEXANDER, junior, and PIRNIE, ALEXANDER.—  
 “ Certain improvements in the application of materials for, and in  
 “ the arrangement of, and method of applying apparatus to be used

"as templates." This invention consists in the use or application for the construction of templates of open woven or closely perforated materials, such as wire cloth, hair cloth, or cloth of other suitable material, or of closely perforated flexible sheets of zinc, copper, or other metals or materials. These templates, which are to be fitted in a sliding frame, being laid upon the frames or plates of the structure, the positions of the rivet and bolt holes required are marked, and the markings are then transferred through the open texture or perforated holes, to the plates or other materials in which the corresponding holes are to be made or punched.

For marking the positions of the rivet or bolt holes on the template, a small hair brush may be used, the end of which, after being dipped in a mixture of whitening and water, is put upon the wire cloth of the template, exactly opposite or over each of the rivet and bolt holes, as seen through the template.

[Printed, 10d. Drawings.]

A.D. 1854, June 20.—N° 1352.

MCLAINÉ, ALEXANDER, junior.—(*Provisional Protection only.*)  
 —"An improved mode of constructing and fitting gun boats."  
 "In constructing gun boats according to this invention, I make  
 "them of iron, sharp at both ends, with rudders at head and stern,  
 "and leave very little side exposed above the water. In the middle  
 "of the upper deck, which is of iron, I mount a cannon of large  
 "calibre, in fixed bearings, held down by bolts, which pass through  
 "the angle iron of the fore and aft bulkheads. The brasses of  
 "these bearings I pack at their rear and under side with vulcanized  
 "india-rubber, or other elastic yielding material, for the purpose of  
 "breaking the force of the recoil. The elevation of the gun is  
 "effected in the usual manner, but the aim is taken by the steers-  
 "man," who steers the boat, so as to bring the gun to bear. "I  
 "employ the power of the steam engine, by which the boat is driven,  
 "to assist in loading the gun." "The sides of the vessel (above  
 "the water line) and so much of the deck space as is not required  
 "to be exposed I render bomb-proof, by covering the same with  
 "balks of timber or compressed cotton, and this I overlay with  
 "vulcanized india-rubber, and cover the whole with plate iron."

[Printed, 3d. No drawings.]

A.D. 1854, June 21.—N° 1356.

**McINNIS, JOHN.**—"An improved composition for coating the  
" bottoms of iron ships to prevent their fouling, and other useful  
" purposes." The invention consists "in the application of a  
" metallic soap, in which may be combined mineral poisons, to  
" the bottoms of iron or wooden ships, to prevent their fouling at  
" sea, by the adhesion of animal and vegetable matter," and  
which it is proposed to apply to the surface to be coated in a  
liquid state.

"The object of my invention is not only to present a poisonous  
" surface (when a cupreous or other poisonous soap is used), but  
" that it shall become smooth and polished by the friction of the  
" water on the composition while the vessel is passing through  
" the water, thereby presenting a surface to which neither bar-  
" nacle or sea weed can adhere." "In preparing a metallic soap  
" for the purposes here intended, I prefer to employ a salt of  
" copper, and, in preference, the sulphate, or, as it is commonly  
" called, 'blue vitriol.' I dissolve 'pale yellow soap' in water by  
" steam, or otherwise, and to every hundred parts thereof I add  
" from forty to fifty parts of the sulphate of copper (blue vitriol),  
" or in such quantity as will cause a complete decomposition of  
" the soap."

[Printed, 3d. No drawings.]

A.D. 1854, June 23.—N° 1387.

**WEILD, JOHN.**—(*Letters Patent void for want of final specifica-  
tion*). — This invention relates to "a system of utilising the  
" drainage or leakage, or preventing the actual waste, of sugar  
" and other valuable cargoes on board ship, by restraining any  
" such drainage from contact with foreign matter. This econo-  
" mising system is carried into practical effect by caulking or  
" otherwise rendering perfectly tight the lining or ceiling of the  
" ship, so as to prevent the leaked matter from mixing with  
" the bilge water; or the same thing may be effected by arranging  
" tanks or other receptacles for the drainage matter to flow into.  
" By thus arranging the vessel the leakage is kept separate from  
" all foreign matters, and it may be afterwards pumped up and  
" retained unharmed for use."

[Printed, 3d. No drawings.]

A.D. 1854, June 24.—N<sup>o</sup> 1398.

DAVIES, JOSEPH.—This invention consists of "improvements" in machinery for propelling vessels, when employing a series of "float boards or paddles, connected and worked in an endless series by chains or other means of connection." When a ship or vessel is to be propelled according to this invention, it is constructed with a suitable channel or channels below the water line, to receive one or more endless series of float boards, arranged so that the propelling machinery may be below the water line of the vessel.

[Printed, 9d. Drawings.]

A.D. 1854, June 27.—N<sup>o</sup> 1411.

BRINDLEY, WILLIAM, junior.—(*Provisional protection only.*)—The invention relates:—Firstly, "to a novel construction of life boats, rendering it immaterial whether the upper side becomes immersed or not, in consequence of the upper and lower sides being alike, and only separated by a perforated diaphragm or flooring, either single or double. A partition runs from stern to stern of each side, answering the purpose of a keel when in the water. The body of the boat is constructed of perforated metal, with a sheathing of the same inside, the interstices being filled up with wood or cork, and in other ways rendered buoyant. The bulwarks, keels, and bottom or bottoms of the boats may be supplied in different ways with air tubes, cork, wood, or other buoyant materials. When masts are used I recommend their being constructed to ship and unship freely, and to provide means for stowing them within the boat alongside the keels

And, secondly, to forming boats as before, "with a perforated bottom, but only one keel, one quarter, or thereabouts, the depth of the boat, having a semicircular sheet of metal set thereon longitudinally, partially concealing the keel, and well stayed, but open at both sides and ends, so that the water entering it can only be upset with considerable difficulty."

[Printed, 3d. No drawings.]

A.D. 1854, July 1.—N<sup>o</sup> 1444.

JOHNSON, JOHN HENRY.—(*A communication from Messieurs Payerne and Lamiral.*)—This invention relates to the general

arrangement and construction of submarine boats, and apparatus connected therewith, and consists,—

First, in the application of steam as a motive power in submarine boats, such steam being generated in the ordinary manner.

Secondly, in the application also as a motive power of steam generated in a peculiar manner.

Thirdly, in purifying the air in the boat “by the aid of a current of water, or of an alkaline solution composed of water, lime, potash, and oxygen.”

Fourthly, “in a peculiar construction and employment of several compartments or divisions, whereby the work to be effected is more easily accomplished, and also in the employment of cocks or valves for the purpose of forming a communication at will between one compartment and another.” Thus the main fore compartment serves to contain the ballast (either solid or fluid) and compressed air. The middle chamber of the boat is divided into two compartments; the first or upper one serves as the entrance chamber, and this is the compartment called the work room. The engine room occupies the upper part of the after chamber, and the lower part is intended, like the one at the bows, to receive the solid and liquid ballast and compressed air. On each side of the main fore compartment are arranged two chambers which can be thrown into one or kept separate by water-tight doors in the interior of the boat; these chambers may be put in communication with the exterior by a door, screwed to the inside of the boat. When this door is opened the water penetrates into the small chamber, but only just above the level of the door, and in each of these chambers a workman can have free use of his hands, whilst at the same time his head is sheltered and above the level of the water in the chamber he occupies.

Fifthly, “in the application of pumps for compressing the air to a certain degree of pressure, according to the depth to which the boat is to descend.”

Sixthly, “in the application of pumps for the purpose of introducing or discharging water from the boat, such water being employed as ballast.”

Seventhly, “in the employment of lateral doors or openings for working at the side of the ship.”

And, eighthly, “in the employment of an anchor in the form of a large weight, to sustain the boat at any desired depth.”

A.D. 1854, July 18.—N° 1577.

BELLFORD, AUGUSTE EDOUARD LORADOLX.—(*A communication.*)—This invention consists of “a prismatic, cylindrical, or  
 “other shaped piston or embolus, which is fixed to or to which is  
 “secured a bag or diaphragm of any suitable flexible material.”  
 The said diaphragm is secured in any convenient way to the inside  
 of the cylinder or prismatic tube or pipe, “in which the abovesaid  
 “piston or embolus is capable of performing a reciprocating mo-  
 “tion, the same as ordinary pistons. One way of securing the  
 “diaphragm in the pipe or cylinder is by means of a projecting  
 “rim on it, the same being held fast between flanges on the pipe  
 “or cylinder, which latter is formed in two parts. The piston  
 “may be attached or secured steamtight to the diaphragm in any  
 “suitable way; for instance, the diaphragm may be open at one  
 “end and have a bottom at the other, the same as a sack or bag,  
 “the said bottom being fixed or made to adhere to the top of the  
 “cylinder; or the cylinder may be fixed higher up in the bag at  
 “any suitable point, according to the moving liquid or fluid used.  
 “The same remark holds good with regard to the length or size  
 “of the piston and of the working length or stroke of the bag, of  
 “the substances used, for both, all these varying according to cir-  
 “cumstances, as this new kind of piston is intended to be applied  
 “wherever common pistons are now or may be employed.”

[Printed, 6d. Drawings.]

A.D. 1854, July 21.—N° 1609.

SEDGWICK, JAMES.—The improvements consist in making  
 the floor timbers and first futtocks of vessels convex throughout  
 the entire lengths of the vessels, so that in every transverse vertical  
 section of a vessel, that portion which lies near to the keel shall be  
 a convex curve. It is also deemed desirable that the transverse  
 vertical sections should maintain their convexity from the keel  
 quite up to the load water line, wherever it is practicable. “The  
 “advantages of the convex principle of construction are, increase  
 “of strength and of carrying capacity, together with superior  
 “speed and manageableness, arising from the entire absence of  
 “that clinging action of the fluid which is universally experienced  
 “in vessels, part of the sections of the submerged portions of  
 “which are concave, and which action is known to be exceedingly

“injurious to their sailing and manœuvring qualities.” “I prefer, when great speed is to be obtained, combining with the convex vertical transverse sections horizontal water lines, which are straight from the stem and stern post respectively, to where they round off and fall off into the midship section, so that the bow and the after part of the vessel shall in such cases severally form wedges of considerable length.”

[Printed, 6d. Drawings.]

A.D. 1854, July 21.—N° 1611.

HARRATT, CHARLES.—“Improvements in fastenings for ship building.” This invention has for its object “improved fastenings to be used in place of trenails and fastenings now employed in ship building, and the improvements consist of making each fastening of three or more parts, in such manner that the parts of a fastening being introduced into the hole drilled, cut, or formed to receive it, are expanded by the introduction of an internal key or instrument; by this means it is not necessary that the fastening should pass through both timbers or planking which it is intended to hold together, and it is preferred that a fastening should not pass through and through; on the contrary, that it should only pass through one of the timbers or planks and partly into the other. For this purpose, each of the outer parts of a fastening is made with a projection or flanch at each end, of such a form that it will pass through or into the hole cut to receive a fastening, and so that when expanded the fastening may by the flanches hold the two pieces of timber or planking together, and prevent their being separated so long as the fastening is in an expanded state.”

[Printed, 6d. Drawings.]

A.D. 1854, July 24.—N° 1621.

ROBERTS, RICHARD.—“Improvements in machinery for punching, drilling, and rivetting.” These improvements consist, firstly, “in putting the fly wheel upon the eccentric shaft of the punching machine, and employing apparatus for disconnecting the punch ram from the eccentric, to give time for the fly wheel to acquire momentum sufficient to punch strong metal plates; also in self-acting apparatus for restoring the connection between

“ the eccentric shaft and the punch ram, by which arrangements  
 “ the punch is advanced and withdrawn more quickly than is  
 “ usually done.

“ Secondly, in putting the fly wheel upon the eccentric shaft,  
 “ and employing apparatus for disconnecting the eccentric from  
 “ the ram, as in the punching machine, and allowing the fly wheel  
 “ time to acquire sufficient momentum to close and rivet metal  
 “ plates together without the intervention of heavy wheelwork.

“ Thirdly, in adapting punching, drilling, and rivetting ma-  
 “ chines, improved as above, for being worked by means of a  
 “ band, strap, or chain passing over a pulley worked by hand or  
 “ other power on the traveller of a travelling crane, or passing  
 “ over a pulley on a fixed motive power engine, and thence  
 “ over pulleys in the travelling crane down to the punching,  
 “ drilling, or rivetting machine, which will be worked by the said  
 “ band throughout the various stages of building the ship or other  
 “ thing to which these machines are applicable.

“ Fourthly, in adapting punching and drilling machines for  
 “ making holes to *template* (an article having marks or perfora-  
 “ tions to be copied), without the labour of marking the situation  
 “ of the holes on the article to be pierced. The manner in which  
 “ this is effected is by fixing the template upon a table in the ma-  
 “ chine, in connection with another table, to which the article to  
 “ be perforated is fixed. Over the template is a pointer, to which  
 “ the marks in the plate are successively brought, and at the same  
 “ time the object to be perforated is brought into position for the  
 “ corresponding hole to be made.”

[Printed, 2s. 2d. Drawings.]

A.D. 1854, August 18.—N<sup>o</sup> 1802.

SPALDIN, SARA.—“ Improvements in apparatus for prevent-  
 “ ing loss of life at sea.” “ A life buoy, of a circular or elliptical  
 “ form, is made of a wicker frame filled with cork shavings, having  
 “ in the centre an aperture through which the person to be  
 “ rescued is placed,” the “ arms resting upon the upper surface of  
 “ the buoy. Around the exterior surface of the buoy is a looped  
 “ rope, to which other persons may cling if necessary. At con-  
 “ venient places in the buoy there are suitable water-tight recep-  
 “ tacles, for containing solid and fluid provisions, candles, and  
 “ a candle lamp, so constructed and fitted with glasses as to be

“ protected from the action of the waves, as also a flag-staff and  
“ rocket tube for the purpose of making signals.”

[Printed, 3d. No drawings.]

A.D. 1854, August 19.—N° 1822.

O'NEILL, CHARLES.—(*Provisional protection only.*)—“ Improve-  
“ ments in the mode or method of fitting up or fixing the berths  
“ in emigrant ships or other vessels.” “ Instead of the usual  
“ method of fixing berths in emigrant ships and other vessels, and  
“ making them quite stationary, I propose to fix and make station-  
“ ary only a portion of each berth, and make the other part so  
“ as to slide in and out either on the lower or upper part of the  
“ decks ; by this means of sliding the berths inwards, I gain more  
“ accommodation in room and better ventilation of the cabins,  
“ or more space if on deck, when they are not in use, than is  
“ obtained by the present method of construction.”

[Printed, 3d. No drawings.]

A.D. 1854, August 19.—N° 1826.

HODGSON, JAMES. — “ This invention has for its object a  
“ construction of vessels for carrying coals and minerals, as well  
“ as other articles.” “ For this purpose, ships or vessels are con-  
“ structed with openings or holes at bottom, with covers or valves  
“ to such openings or holes, which can be readily applied and  
“ removed, and be fixed water-tight by screws or otherwise.”  
Such vessels on arriving with a cargo at their destination, are  
to be raised out of the water on a slip, by means of a suitable  
power ; the covers or valves are then to be removed from the open-  
ings or holes in the bottoms of the vessels, and the cargo discharged  
through such holes or openings into waggon or lighters. The  
covers or valves may then be replaced and fixed water-tight, and  
the vessels floated. “ In order to carry water ballast, and give sta-  
“ bility to the interior of the ship, I construct it with inclined  
“ longitudinal water-tight bulk-heads, in the spaces between  
“ which and the sides of the ship or vessel, water is placed after  
“ the cargo is unloaded.”

[Printed, 3d. No drawings.]

No. 19.

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A.D. 1854, September 6.—N° 1947.

**WESTWOOD, JOSEPH, and BAILLIE, ROBERT.**—A “method  
 “ of applying preservative compositions both internally and ex-  
 “ ternally to the plates and other parts of which iron ships and  
 “ vessels are constructed. Asphalte and bituminous varnishes  
 “ are known as forming good preservative coatings, but it has  
 “ hitherto been found impracticable to cause them to adhere to  
 “ the metal. Now, our invention consists in first laying on a  
 “ layer or coating of black varnish, and then a layer of asphalte, or  
 “ a coating of boiled oil and black lead and black varnish, or of  
 “ black varnish, asphalte, and spirits of naptha.” “In some cases  
 “ we combine a portion of white arsenic with the compositions  
 “ used for the outside of iron ships and vessels, in order to  
 “ prevent the adhesion of animal matters, &c., to the plates.”

On the 14th of January 1858, Charles Bickford and James Baillie, assignees of the Letters Patent for the invention herein specified, disclaimed any right or title to the use of any material or materials referred to in the above Specification, “besides those  
 “ consisting of a layer or coating of black varnish, and over or  
 “ upon that a layer of asphalte.”

[Printed, 3d. No drawings. Disclaimer printed, 3d.]

A.D. 1854, September 7.—N° 1953.

**LUND, HENRY.**—“Improvements in propelling and steering  
 “ vessels, and in the steam engine applied to these purposes.”  
 Letters Patent were granted to this inventor on the 30th day of  
 April 1851, for “an improved method of propelling vessels, which  
 “ consists in the employment of rowing propellers fixed in pairs  
 “ below the water line, and so actuated that when one oar of each  
 “ pair is going back active and propelling the vessel, the other is  
 “ coming forward feathered and ready to take its place.” This in-  
 vention relates, among other things, to the employment of the said  
 propellers in steering and otherwise controlling the vessel. It is  
 proposed to use an oar as a rudder, having the same mechanical  
 arrangements as are now applied to a rudder, as “it would be  
 “ much firmer and be easier moved and more readily kept in  
 “ repair than with the present method of suspending the rudder  
 “ outside the ship.” As these rudders would be placed near to or

below the water line, it is proposed that the apertures through which they pass should be kept water-tight "by a V-shaped metal crescent, which turns or moves in a corresponding metal seat in the side of the vessel. This crescent slides easily on the staff of the oar, and is kept water-tight thereon by a stuffing box. Sufficient contact is maintained between the crescent and its seat by a spring and set screws at its back, without causing any needless friction." Two rudders of this construction may also be used, one in each run of the vessel, "which would be of great advantage where a screw propeller is applied, or in all three places at the same time in paddle-wheel or ordinary sailing vessels. In cases where a quick control is required over a boat or vessel, a similar arrangement of rudders might be made at the head and bows of the vessel, and worked simultaneously at any convenient part of the vessel by suitable connecting links, chains, or ropes."

[Printed, 2s. 1d. Drawings.]

A.D. 1854, September 8.—N<sup>o</sup> 1956.

BURNS, JAMES.—"Improvements in ventilating ships." This invention consists in an apparatus by means of which the rising and falling of the waves, or the pitching of the vessel, may be made "to force fresh air from the outside to the lower parts of the interior of ships." The apparatus is constructed as follows:—An air trunk runs from one end of the hold of the ship to the other, either below the "limbers," or upon them. With this, branch trunks are connected, leading into the various store rooms, all of which trunks are perforated on the lower side. The foremost end of the fore-and-aft trunk is connected with one leg of a bent or syphon-shaped pipe, the neck of which is situated a considerable distance above the water line. The other leg of the bent pipe passes out through the bottom of the ship, so that water stands in this leg at the height of the water outside, or rises and falls with it. Between the neck and the water's surface in this leg, a pipe is led out through the bows of the ship, to communicate with the external air, and a valve is placed in it opening inwards. In the same leg also, and above the air pipe there is another valve opening upwards, which can be closed by a float when the water rises too high. As the water falls in the pipe, air rushes in by the pipe through the bows; and as it rises, this air is

forced through the upper valve into the air trunks, and is thence diffused throughout the hold of the ship.

[Printed, 11d. Drawings.]

A.D. 1854, September 8.—N° 1962.

**MACALLISTER, ROBERT.**—(*Letters Patent void for want of final specification.*)—The invention consists “in fitting to the dead wood  
“ of ships and vessels on each side of the propeller shaft, and  
“ both in front of and behind the propeller, a guard or screen, of  
“ a semicircular section, but tapering away to a point, by which  
“ means the resistance of the water to the revolution of the pro-  
“ peller will be reduced, and the outer parts of the blades or  
“ most efficient propelling surfaces will alone act on the water,  
“ the centre part of the propeller being, as it were, cut off from  
“ action.”

[Printed, 3d. No drawings.]

A.D. 1854, September 28.—N° 2088.

**WOODWARD, JOHN.**—(*Provisional protection only.*)—“Appa-  
“ ratus for stopping shot and other holes in ships and vessels.”  
The invention consists “in a peculiar apparatus, the head of which  
“ is thrust through or into the hole from the inside of the ship,  
“ when a spring is caused to act upon and throw out two or more  
“ arms, which have been previously covered with leather, gutta  
“ percha, or other like suitable material, somewhat after the  
“ manner in which an umbrella covering is mounted upon its  
“ frame. The leather covering fits close to the vessel’s side, and  
“ the outer ends of the arms, ribs, or frames are made to lie  
“ upon and embrace the vessel’s side, by means of a stretcher  
“ mounted upon a screwed shaft, upon the upper part of which  
“ the inner ends of the arms are hinged. The stretcher is forced  
“ down against the arms by means of a nut.”

[Printed, 3d. No drawings.]

A.D. 1854, October 10.—N° 2171.

**CHUBB, WILLIAM.**—“Improvements in the construction of  
“ beams and parts of ships, ships’ masts and spars, and other like  
“ structures.” The invention consists in forming angle-iron  
beams or bars, composed of several parts, and combining them

with, or imbedding them in wood, the forms of the parts varying according to the requirements of the structure.

The timbers of ships may be put together in this manner, and also the parts of ships' masts and yards, and other structures of a like character, requiring strength.

[Printed, 6d. Drawings.]

A.D. 1854, October 18.—N° 2231.

COOKE, BENJAMIN FRANKLIN.—(*Provisional protection only.*) —“An improved mode of caulking ships, applicable also to the “rendering of roofs waterproof.” The object of this invention is to render ships' seams water-tight in all latitudes, by the use of an elastic caulking material, which is tightly compressed between the planks of the ship, and will expand when the wood shrinks. The elastic material which it is proposed to employ is a compound known as sponge gum. It is usually made by introducing alum into the ingredients of vulcanized india-rubber, whereby the compound is rendered cellular, after it has been subjected to heat. In applying the compound, a longitudinal groove is formed in the edges of the planks, in which a strip a quarter of an inch thick (more or less) is inserted, when the planks are being laid; or the strip may be folded, or grooved on its edge, to permit of its opening laterally when the planks shrink. This mode of caulking is also applicable to the roofs of buildings, for preventing the passage of water through skylights, &c.

[Printed, 3d. No drawings.]

A.D. 1854, October 19.—N° 2240.

HIGGINS, THOMAS.—(*Provisional protection only.*)—“Improved “apparatus applicable to the ventilation of ships and mines and “other useful purposes.” “This invention consists of two “circular tubes or pipes, in which are placed shafts with screws “formed upon them, so as to fill the space within the pipes, or “nearly so. The screw shafts are mounted upon suitable “bearings, and are each provided at the upper end with a fan “turncap, which is acted upon by the wind, and which gives “motion to the screw shafts. One of the screw shafts rotates so “as to carry a current of air down the pipe, and the other, travel- “ling in a reverse direction, will cause a current to travel up the

pipe. By this arrangement it will be seen, that if the fan caps be acted upon by the wind, and the lower ends of the pipes be introduced into, say, the hold of a ship, a constant current of air will be carried therefrom by one pipe, and discharged therefrom by the other. A screen or hood is attached to the top of the pipes, which is mounted so that it will shift round to protect the portion of the fan cap or wind propeller not required to be acted upon by the wind."

[Printed, 3d. No drawings.]

A.D. 1854, October 26.—N<sup>o</sup> 2286.

DUDGEON, JOHN.—*Provisional protectionraig.*—The object of this invention is so to construct ships and batteries with curved surfaces of iron, as to cause shot to be deflected therefrom. For this purpose, the side of a ship or the face of a battery is to be cased with, or formed of iron of curved forms, such as will deflect shot; and the parts which are subject to shot are also to be made double, so as to contain water compressed between them by an hydraulic pump.

[Printed, 3d. No drawings.]

A.D. 1854, October 28.—N<sup>o</sup> 2287.

BLAKE, CHARLES.—"A method of preventing or lessening the injurious effects arising from collisions at sea and on other navigable waters." The invention consists in fitting to the bow of a ship or other vessel a false bow, buffer, or striking plate, attached to the end of a rod or rods working through a stuffing box or stuffing boxes in the bow: the inner end of the rod or rods bearing upon or being otherwise connected to springs, which are to be of such strength as to withstand the shock which the ship or vessel is likely to sustain should she come in collision with another vessel or other object." The false bow, buffer, or striking plate, is to be so constructed, as not to interfere with the stowage, working, or sailing of the ship or vessel.

[Printed, 3d. No drawings.]

A.D. 1854, November 1.—N<sup>o</sup> 2325.

FRANCIS, JOSEPH.—The invention consists in constructing road and ammunition waggon bodies, military caissons, &c., for

the transportation of stores, powder, and fixed ammunition, of corrugated wrought metal of any required form and dimensions, for the purposes of land carriage; which shall also be capable of use for transportation across streams, &c., without unloading; thus serving the purpose of boats, and barges, or batteaus, for which latter purpose they may in certain forms be solely used.

[Printed, 7*d.* Drawings.]

A.D. 1854, November 2.—N° 2328.

DEWEY, LORING D.—(*Provisional protection only.*)—The invention consists in so using and applying certain materials, mineral and vegetable combined, “that an anti-combustive gas will be generated in burning, or water discharged, or both,” to stop and put out a fire, occurring in any buildings or vessels in which they may be deposited.

“The materials for this purpose are nitrates & sulphur, and cloth, paper, or the like integuments. Of these materials combined, whose ready burning produces anti-combustive gas in large quantities, are constructed tubes, cords, or parcels of longer or shorter extent & varied size.”

[Printed, 3*d.* No drawings.]

A.D. 1854, November 6.—N° 2343.

BETTELEY, JOSEPH.—“Improvements in the construction and manufacture of iron knees, and the application thereof for ships’ fastenings.” The invention consists in forming the knees for ships and vessels, of rolled plate or bar iron of various shapes of section; the length required for forming a knee being afterwards bent and forged into the shapes required. The knees may thus be hollow instead of solid.

[Printed, 6*d.* Drawings.]

A.D. 1854, November 7.—N° 2350.

LANGLOIS, LOUIS NAPOLEON.—Improvements in the construction of steam-boats, specially applicable to those navigating canals and rivers.

The invention consists “in constructing paddle-wheels with paddle boards and screw-formed paddles,” and “in employing turbines on either side of the boat, for the purpose of supplying the wheel with the water displaced by it in turning.”

[Printed, 1*s.* 2*d.* Drawings.]

A.D. 1854, November 10.—N° 2392.

**WITTHOFF, HENRY.**—“Improvements in the construction of boats, ships, or navigable vessels, and in the means of obviating or diminishing the dangers attending accidents to the same.” These improvements consist, firstly, in making the bulk-heads, or partitions which divide the water-tight compartments of vessels, double or of two distinct partitions, enclosing an intervening space.

Secondly, in increasing the resisting power of such bulk-heads by stays bracing or binding them together at various points.

Thirdly, in filling the interstitial cavities between the external walls or sides of such double bulk-heads, with a substance calculated to obstruct or prevent the transmission of heat or fire, and also to increase the power of the bulk-head to sustain the pressure of water.

Fourthly, in the application and use of pipes and pumps for the purpose of introducing water into the interstitial cavities of such bulk-heads.

Fifthly, in the application of a lining or casing to the outer shell of the vessel, enclosing an interposed material repellent of water, or in some cases a heavy material to serve as ballast.

Sixthly, in the use of cork as a material for filling any of these interstitial spaces or cavities.

[Printed, 4d. No Drawings.]

A.D. 1854, November 21.—N° 2461.

**HUNT, EDMUND.**—This invention relates “to various modifications of screws or oblique-bladed propellers to be used in the propulsion of ships or vessels in water, and to a mode or modes of constructing ships or vessels, so as to render them more suitable for screw compulsion; a portion of these improvements being also applicable to paddle steamers, sailing ships, and other vessels.” The improvements in ships and vessels relate, firstly, to the rudders of screw steamers, being more particularly applicable to vessels with double sterns and two propellers. This improvement consists in employing a single rudder placed at the bow of the vessel. The rudder may be hung in any convenient manner, but it is preferred to arrange it with its axis of vibration

at or near its front edge. This rudder may either be carried by a rudder post, which will answer as a front guard, or a guard frame may be fitted up in advance of its front edge. The rudders of screw vessels with single sterns may be arranged in the same way.

Secondly, "to the general shape of sea-going vessels, more particularly screw steamers, the main object being the attainment of a cleaner run or stern than is at present given to such vessels. In proceeding to design a vessel according to this plan, the length and depth being determined, the parallelogram of like dimensions is taken, and an arc of a circle or other suitable curve is drawn tangentially to the lower side thereof, commencing from a point as far forward as may be, and running up quite above the water level at the stern. This curve defines the depth of the body of the vessel along the longitudinal centre line. Next, the plan or outline of greatest width as projected upon a horizontal plane is chosen, it being preferred to design this outline so that the centre of the immersed bulk of the vessel may lie in or near the longitudinal centre of the vessel at the water line." The main-breadth line, or the line defining the heights of the greatest breadths, is then delineated on the vertical longitudinal plane, and a series of vertical lines are drawn corresponding to the ship's frames. The greatest transverse vertical section is then to be designed, and the parallelogram circumscribing it is divided by any convenient number of horizontal and vertical lines set at regular distances apart. In proceeding to design the after portion of the vessel, each transverse sectional outline is obtained by dividing the respective circumscribing parallelograms by the same number of horizontal and vertical lines as in the main section. "The sectional outlines are then traced on the various sections so as in each case to intersect the divisional lines, in precisely the same manner as the main outline intersects the divisional lines upon its circumscribing parallelograms. By these means a flat or convex run will be obtained, which will gradually rise, until at the stern it will run up above the water line, and this description of run is preferred, as it admits of the freer access of the water to the propeller. This form is also deemed advantageous for paddle steamers and sailing vessels." Vessels with the ordinary form of run may be designed in the same way, it being merely necessary to add to each transverse section a couple of concave curves tangential to

the vertical centre line, and to the outline previously obtained, in the manner herein-before described.

A modification of the same geometrical process may be employed in designing the forward part of the vessel. The parallelograms circumscribing the several transverse sections, are divided vertically and horizontally by the same number of lines as the greatest or main transverse section, but instead of being divided equally, the ratios between the horizontal divisions are gradually and regularly varied towards the stem of the vessel, the vertical divisions being equal, or the vertical divisions may be varied, the horizontal ones being equal; or, again, both the vertical and horizontal divisions may be varied. The circumscribing parallelograms of the several sections being thus divided, points of intersection are marked "in the spaces corresponding to the spaces on the main section through which the main outline passes, and a curve is drawn through these points of intersection in each case, such curve being the outline of the vessel at the respective section."

[Printed, 2s. 2d. Drawings.]

A.D. 1854, November 23.—N<sup>o</sup> 2476.

SHAW, STEPHEN.—"An improved mode of marking metal plates for rivetting or bolting, and the application of a new material as a template for receiving such marks." The first part of the invention consists of a mode of marking the position of rivet holes in metal plates; this is effected by means of an improved "reverser," which instrument "resembles in appearance a pair of tongs, or a clip, having between the upper and lower parts a flexible tongue or spring. The ends of the clip or reverser are perforated. The hole in the upper jaw enables the workman to see when the ends are exactly over the spot where the hole is to be punched in the plate. In a hole made in the tongue or spring is placed a tin cup or vessel, containing a small quantity of the marking fluid. The lower part of the cup terminates in a cylinder, which projects through the hole in the lower jaw. When the jaws of the clip are brought together, the pressure of the upper jaw forces the cylinder down upon the plate below, and causes a portion of the marking fluid to flow down the inside of the cylinder (which is made double

“ for the purpose), and leave a mark or ring of colour upon the  
“ surface below the ‘clip.’ This reverser may be used to mark  
“ the position of the rivet holes upon the templates, as well as on  
“ the plates intended to be punched.”

The second part of the invention relates to the application of a new material as a template to be used in the construction of iron ships. The material used for the purpose of forming portions of the template is a perforated substance; for example, a sheet of zinc, gutta-percha, or other suitable material, the area of which is perforated with holes.

[Printed, 10d. Drawings.]

A.D. 1854, November 29.—N° 2513.

**HYDE, JOHN MOORE.**—“ Improvements in iron steam ships,  
“ and in boilers, and machinery for propelling the same.” The improvement in steam ships consists in constructing the after part of the hull in such a manner that the “single blade propeller,” which it is proposed to employ, may, when the blade is vertical, be entirely covered by the abutment of the hull at the fore part of the aperture, and may thus offer no resistance to the passage of the vessel through the water.

The propeller “is to be balanced by an adjustable weight on  
“ the shaft or driving wheel inside the ship, so as to counteract  
“ or counterpoise its leverage, to prevent vibration; the opening  
“ occupied by the same to be enclosed by plates sliding in grooves,  
“ so as to continue the run of the ship from the screw post to the  
“ stern post, when the propeller is not in use and the ship is  
“ under canvas.”

It is also proposed to construct the after part of iron ships in such a manner “that the stern post of the ship and the main  
“ post of the rudder shall terminate as far below the deck as  
“ possible; the main post of the rudder from this point to be  
“ formed of brass or other non-magnetic material,” that the local attraction of such iron ships may be reduced.

[Printed, 10d. Drawings.]

A.D. 1854, December 6.—N° 2558.

**BULLOCK, AUGUSTUS THOMAS JOHN.**—(*Provisional protection only.*)—“An improved raft or apparatus for saving life at  
“ sea.”

The invention consists in a sliding raft, which is to be fitted to all ships, whether sailing vessels or paddle wheel or screw steamers, in such manner that it can be readily launched, or that it will float off in the case of the ship foundering. In paddle-wheel steamers the upper parts of the paddle boxes are made use of, and are connected firmly together by means of two bridges or planks, which extend across the ship. For the purpose of rendering the raft more buoyant, tubes or air cases are to be applied to the bridges and covers of the paddle boxes.

In sailing vessels and screw steamers, the upper parts of the bulwarks are to constitute the raft, and in men-of-war the upper parts of the hammock nettings.

[Printed, 3d. No drawings.]

A.D. 1854, December 6.—N° 2565.

ANDERSON, JAMES.—(*Provisional protection only.*)

This invention relates to a mode of bending angle iron of various sections into the forms required for the frames of iron ships, and for other purposes. In carrying out the invention as applicable to ship-building purposes, a level platform is used, such platform being made up of pieces susceptible of being changed, so as to increase or diminish its extent, or so as to modify the arrangement of a number of dovetail grooves by which it is traversed. These grooves run in straight lines, and serve to guide the shaping blocks used in bringing the angle iron to the required form for the ship's frames, and the directions of the grooves are arranged as nearly as possible at right angles to the curves to which most of the frames are made.

A series of carrier pieces work on the grooves, being actuated by a longitudinal screw working in a half-nut formed in the bottom of the groove, and turned by means of small bevil wheels and a vertical spindle, or by other means. These carrier pieces carry the blocks for bending and shaping the frames, the blocks being mounted on swivel joints. The blocks are also furnished with face pieces, which are capable of adjustment to any angle. Shaping blocks are to be used on both sides of the frame, there being two in each groove, which are moved towards each other, the angle or other iron to be bent or shaped being between them.

[Printed, 3d. No drawings.]

A.D. 1854, December 9.—N° 2587.

CORTLAND, JOHN.—(*Provisional protection only.*)—A self-disconnecting raft or bridge, composed of a wooden frame, to the sides, ends, and bottom of which are fastened air-tight tanks, tubes, or caissons. It is to be placed on skids or ways across the deck of any vessel, and when so placed can easily be launched into the sea, in case of fire or any other accident. This raft or bridge is particularly adapted for steamers and passenger ships, answering on board steamers the purpose of the bridge now in general use.

[Printed, 3d. No drawings.]

A.D. 1854, December 13.—N° 2623.

BERDAN, HIRAM.—(*Provisional protection only.*)—"A compressible life boat."

This invention consists in the novel construction of a frame to support and "sustain in shape a covering of india-rubber, india-rubber cloth, or any flexible waterproof material to form a light portable boat, which when not required for service may be folded so as to occupy comparatively little room, but may be expeditiously extended" and brought into proper condition to be launched for service.

"The principal portion of the frame of the boat, consisting of the keel, the stem, & the stern post, may be made of a single piece or of two or more pieces of wood rigidly united."

The ribs are hinged to the upper parts of the sides of the keel, so as to be capable either of standing at right angles to the keel or lying close beside and parallel to it. These ribs, except in being divided in the middle and hinged to the keel, need not differ from those of ordinary boats. The gunwales are formed of two light metal bars, of proper curvatures; they are attached, one on either side, by hinge or link connexions at the ends, to the upper parts of the stem and stern post, and when the boat is not in use they fall down and lie parallel to the keel, stem, and stern post. When the boat is ready for use, the gunwale bars are kept in place by resting on the tops of the ribs, and between them will be placed cross stays, to give stiffness to the framing. Applied to the frame is a waterproof covering, made of one or more pieces, and attached in any desirable way to the gunwale

bars, the keel, stem, and stern post, but not to the ribs. When intended for a life boat, the covering should be provided with proper air chambers, at stem, stern, and sides, to be inflated when required.

[Printed, 3d. No drawings.]

A.D. 1854, December 14.—N° 2636.

**HENDERSON, PETER EDWIN.**—(*Provisional protection only.*)  
—"Improvements in ventilating ships."

To any suitable part of the ship's sides, fan wheels are to be connected, which are to receive rotary motion from the water, either directly or through the medium of gearing; the use of the wheels being to convey fresh air into a small cupola, and from thence to force it through gutta percha or other tubes, to the cabins or other parts of the vessel which it is desired to ventilate, the tubes having cocks connected with them, by opening which fresh air may be directed at pleasure to any cabin or other part of the ship. By reversing the direction of motion of the fan wheels, the tubes may be used as respirators, exhausting or conveying away the vitiated air from the cabins and other parts of the ship.

[Printed, 3d. No drawings.]

A.D. 1854, December 18.—N° 2660.

**STANSBURY, CHARLES FREDERICK.**—(*a communication from F. Z. Tucker.*)—"An improved life car or buoy." It consists of a series of cylinders connected together by rods or bolts, each cylinder being divided by water-tight partitions into several compartments, the whole forming a portable life car or buoy, for the use of ships and other vessels. The car may be suspended in various parts of a ship without occupying much room, or the cylinders, detached from each other, may be stowed away in any convenient place until required for use, when they may readily and speedily be fastened together.

[Printed, 6d. Drawings.]

A.D. 1854, December 19.—N° 2677.

**TUCKER, JOSEPH.**—This invention consists "in constructing  
" ships in such manner that the quarter-deck may be readily de-  
" tached and used as a raft for saving life in case of shipwreck;  
" and for this purpose the ship is arranged in such a manner that

“ the only entrance to the cabins under the quarter-deck is from  
“ the said deck, and the floor of these cabins (which is separate  
“ from the deck on which it rests), is caulked or made water-tight,  
“ so that when launched together with the quarter-deck into the  
“ water, the whole resembles a flat-bottom boat, square at the  
“ ends, and of small draught of water, and which may be provided  
“ with masts and sails if requisite.”

[Printed, 6d. Drawings.]

A.D. 1854, December 21.—N<sup>o</sup> 2692.

BERTRAM, WILLIAM.—“ Improvements in the manufacture of  
“ iron ships, steam and other boilers, bridges, and other structures  
“ where numerous sheets of iron are used.” The object of this  
invention is to cause the sheets of iron employed in these struc-  
tures to be so formed at the edges that they may be welded to-  
gether, instead of being united by rivets; and where ribs or angle  
irons have heretofore been used, and are required to give strength to  
the structures, the sheets of iron are to be forged or rolled with  
ribs thereon in such a manner, as to admit of the edges and the  
ribs of one sheet being welded to those of another, such ribs being  
made either transversely, or in the direction of the lengths of the  
sheets. In ship-building, the keel and keelson and also the cut-  
water and stern-post, are all to be welded into one piece of iron,  
and the sheets and ribs welded thereto; and in order to bring up  
the parts about to be welded together to a welding heat, as they  
must be heated and welded in their positions, two portable forges  
or furnaces are used, one on either side of the two sheets or parts  
which are to be welded together.

Each of these furnaces consists “ of a vessel or chamber to  
“ contain fuel, having an opening on one side to receive the end  
“ of the blowing pipe, and at the opposite side an opening, so  
“ that when the blast of air is sustained, and the opening has the  
“ sheet or part resting against it, the flame and heat will be pro-  
“ jected against the surface of the iron, and as the other furnace  
“ is held and used on the opposite side of the iron, the two pieces  
“ in contact, and which are to be welded together, will become  
“ heated to a welding heat, when two hammermen striking to-  
“ gether, or one pressing and the other striking, weld the two  
“ heated parts together; or in place of hammermen it is preferred  
“ to have two steam hammers opposite each other, or one steam

“ hammer and an anvil. For the purpose of facilitating the use  
 “ of the portable furnaces and portable steam hammers, they are  
 “ mounted in suitable frames which move on rails, in some cases  
 “ above and in other cases on the ground, and the frames, rails,  
 “ and apparatus used with the portable forges and steam hammers  
 “ are to be such as to admit of their following the varying form  
 “ of the structure” upon which the operations are being performed.

[Printed, 1s. 10d. Drawings.]

A.D. 1854, December 29.—No. 2751.

THORNEYCROFT, THOMAS.—(*Letters Patent void for want of final specification.*)—“The object of this invention is to obtain  
 “ greater strength, more particularly with reference to ships of  
 “ war, and to render such ships less liable to injury from shot and  
 “ projectiles; also to prevent their being boarded by an enemy.  
 “ For this purpose, the upper part of the body of a ship above  
 “ the water line is constructed by the employment of bars of  
 “ wrought iron, which are made to pass in front and at the back  
 “ of each other, so that a basket or woven work of bars of iron  
 “ is produced in the form desired, and the same is rendered  
 “ waterproof by timber or planking; and in order to prevent a  
 “ ship being boarded by an enemy, steam pipes are conducted and  
 “ fixed round the upper parts, in such manner as to have openings  
 “ for the passage of streams of steam, which may be turned on  
 “ from the boiler when required.”

[Printed, 3d. No drawings.]

A.D. 1854, December 30.—No. 2756.

MAYEUR, EUGÈNE.—(*a communication from Thomas Platti.*)—  
 The invention “consists in the construction of a new hydraulic  
 “ pump or machine, based on the centrifugal principle, for raising  
 “ water, and also muddy waters, for agricultural and other purposes,  
 “ and for the salvage of ships and other vessels.” The machine consists of four cones of sheet iron, fitting one within the other, and united by diaphragms. The vertical shaft, on which the machine rests, and through which the motion is communicated, carries in the interior of the machine a solid cone of metal, wood, or other suitable material, of a determined weight. This weight performs the office of a fly wheel. On the exterior surface of the solid cone the paddles or blades are placed. At the lower part of the shaft is a pivot, varying in form, according to

the socket in which it is to be placed. A cap and cover stop up the empty space in the middle of the machine, and cause the water to flow out at the side instead of running over at the upper part of the apparatus. This improved hydraulic pump has this peculiar advantage that it may be employed in very deep waters; and from its simple construction, not having any part liable to be put out of working order, will be equally applicable in shallow and even muddy waters.

[Printed, 7d. Drawings.]

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A.D. 1855, January 1.—Nº 4.

CRAM, GEORGE, and CRANE, JOHN JACKSON.—“An improved composition, applicable to the coating of ships’ bottoms and other useful purposes.” The invention consists “in the application and use of a composition or mixture formed of white lead, red lead, litharge, japanner’s gold size, boiled linseed oil, and turpentine, for the purpose of protecting ships’ bottoms, and other surfaces which may be coated or covered therewith, from the action of the atmosphere and sea water, and to prevent the adhesion of animal or vegetable matter thereto.”

The following proportions are preferred:—

“One hundred and twelve pounds weight of dry white lead of commerce; eight pounds weight of dry red lead of commerce; six pounds weight of the litharge of commerce; three gallons of japanner’s gold size; one gallon of boiled linseed oil; and half a gallon of spirits of turpentine.”

[Printed, 3d. No drawings.]

A.D. 1855, January 9.—Nº 52.

HODGSON, THOMAS.—(*Provisional protection only.*)—“An improved construction of paddle-box life boat.” The upper part of paddle boxes is to be so constructed as to admit of being readily detached from the ship, and thrown into the water or launched, to serve as a life boat in cases of shipwreck or accident.

“ The upper portion of the paddle box may be of the same form  
 “ as the top of the fixed paddle boxes in common use, and con-  
 “ structed of wood or of plate iron. It is intended to rest on the  
 “ lower or fixed part of the paddle box, and be secured thereto  
 “ by bolts passing through eyes in the ends of straps attached to  
 “ the sides and ends of the boat and the lower portion of the  
 “ paddle box. All the bolts for either side or end are to be secured  
 “ to a single rod for the purpose of disengaging them simultane-  
 “ ously.” “ The steps by which the top of the paddle box is  
 “ reached when the boat is in its place on board the vessel, are  
 “ all tight chambers extending the whole width of the paddle  
 “ box or boat, and they are used as water tanks and provision  
 “ lockers, and in part as air chambers to give great buoyancy  
 “ to the boat. By using the top steps as the fresh water tanks,  
 “ the next below as provision lockers, and the lowest ones as air  
 “ chambers, and keeping the tanks and lockers always filled, the  
 “ boat will be certain to right itself, whatever may be its position  
 “ when it first reaches the water.” “ The tanks are to be reached  
 “ by cocks or plugs, or their equivalents, on the inside of the  
 “ boat, and the provision lockers are to have openings on the  
 “ inside covered by doors or lids of some water-tight con-  
 “ struction.”

[Printed, 3d. No drawings.]

A.D. 1855, January 19.—N<sup>o</sup> 147.

ABBOTT, JOSEPH, and HOLLAND, HENRY.—(*Provisional protection only.*)—“ Certain improvements in preventing the  
 “ sinking of vessels at sea or on rivers, and in raising of sunken  
 “ vessels.” The invention consists in adapting and applying to  
 vessels air-tight bags, of india-rubber or other suitable material,  
 and protected externally by strong net work, such bags being in  
 communication with an air pump or machine, by means of which  
 they may be readily inflated, when the ship is in danger. The  
 bags are distributed about the main deck, or in other convenient  
 parts of the vessel.

For the raising of sunken vessels, a sufficient number of the  
 bags are conveyed and secured to the vessels by divers, and are  
 then inflated by an air pump situated in a vessel floating over the  
 work.

[Printed, 3d. No drawings.]

A.D. 1855, January 24.—N° 180.

ANDERSON, SIR JAMES CALEB.—“Improvements in steering “ships.” These improvements consist in steering ships by the aid of hydraulic or steam pressure. For this purpose a cylinder is placed in a convenient situation, across the ship. The piston is to be fixed on the centre of the piston rod, which must be longer than double the length of the cylinder. To each end of the piston rod a chain is to be attached, which working on wheels, will convey the power from the cylinder to the tiller. The cylinder is to have a three-way valve, and its slide is to be worked by a finger, fixed on the lower end of a vertical shaft, which the steersman can move in the required direction, by means of a small horizontal wheel.

[Printed, 1s. Drawings.]

A.D. 1855, January 25.—N° 188.

POWELL, HENRY BUCKWORTH.—(*Provisional protection only.*) “An improved precautionary keel, to be applied to vessels when “in shallow water, or other difficult navigation.” It consists of a strong frame of timber in several pieces, forming three sides of a parallelogram, one of which is the length of the vessel, and the other two extend from two feet or more below the keel, to the top of the stem and stern-post respectively, to which they are bolted. There is a hinge joint in each of these upright pieces just above the water, so that by hauling upon the longitudinal piece from within the ship when it has performed its duty, by giving notice of the shallow water, the frame may be lifted out of the water and disconnected.

[Printed, 5s. Drawings.]

A.D. 1855, January 27.—N° 210.

DAVIS, ELIAS.—(*Provisional protection only.*)—Improvements in rendering paper waterproof, for ships’ sheathing, &c. The invention “refers to certain applications of india-rubber, gutta “percha, and their compounds, with or without other ingredients, “for rendering paper waterproof.”

Solutions “may be composed in the proportions of about two

" parts india-rubber, one part gutta percha, and two parts rectified spirits or other solvents."

[Printed, 3d. No drawings.]

A.D. 1855, February 5.—N° 264.

BELLFORD, AUGUSTE EDOUARD LORADOUX,—(*a communication from Virgil Putnam Corbett.*)—" An improved invention for constructing hulls of vessels." " It consists in the employment of a lining of india-rubber, or any elastic waterproof composition formed in part of india-rubber, between the timber and planking of the vessel, extending over the whole of the vessel from the keel up to any desired height above the water line. The elastic composition may be placed between two layers of canvass or other strong fabric."

[Printed, 6d. Drawings.]

A.D. 1855, February 7.—N° 295.

NEWTON, ALFRED VINCENT,—(*a communication.*)—" An improved mode of constructing dry docks." " This invention consists in making use of the natural clay foundation for the floor of the dock, the sides and back end being formed of piles, the puddling between the inner and outer piling resting upon the clay floor, and forming a continuation of it, after the manner in which coffer dams are puddled, the front end of the dock through which the vessels are admitted being occupied by the gates." The inventor considers that some of the advantages which a dock constructed upon this principle possesses over all others heretofore constructed, are, " 1st, the original cost is less than one-tenth of that required for a permanent stone dock; 2nd, no partial strain upon any part of the floor of the dock can possibly result in injury to the structure, as the whole weight is borne by the natural stratum, and it matters not where or to what extent this weight be imposed upon the floor of the dock. This characteristic renders this dock capable of accommodating vessels which are badly hogged, and that would be in consequence refused admittance into any other docks; 3rd, the dock is far more comfortable to the workmen than a stone dock, which remains for a long time cold and damp after it is emptied of water."

[Printed, 9d. Drawings.]

A.D. 1855. February 22.—N° 391.

HARRISON, THOMAS.—“ A composition for covering and protecting the bottoms of ships and vessels.” To prepare the composition, melt by the heat of steam, thirty-five parts of Trinidad or other pitch or rosin, to which, when thoroughly melted, add thirty-five parts of a preparation of chalk, made by washing out all particles of sand, and afterwards drying and grinding to a fine powder. When these are well mixed, add carbonate of barytes, in powder, twenty-five parts; sulphate of copper, in powder, five parts. The whole being well mixed, and allowed to cool down to one hundred degrees, add as much crude naphtha or spirit of turpentine, as will make it of a consistence fit to be used with a brush.

[Printed, 3*l*. No drawings.]

A.D. 1855, February 23.—N° 407.

THOMSON, NATHAN, Junr.—The object of this invention is to construct boats for civil and military purposes in such manner, that they may be more readily folded and packed and carried than those heretofore made. For this purpose each of the two sides of a boat is made of two or more pieces, hinged or connected together, the joints where they are hinged or connected being made water-tight by waterproof fabric or material; the two sides of the boat are connected together so as to form the two ends of the boat, the parts connected being also rendered water-tight by waterproof fabric or material.

“ In order to construct my boat I procure two sides of rigid  
“ material in sections connected together by proper hinges, and  
“ attach these sides each to each at the ends by hinges between  
“ these two ends. I locate a longitudinal brace or keelson, secured  
“ to the end hinges in such manner that the sides may slide length-  
“ wise of the said brace or keelson; and to this brace or keelson ”  
“ I hinge a solid floor, one on each side of said brace or keelson,  
“ also cross braces to hold the bottom down in its place when  
“ swung open, the said solid floorings or bottom of the boat rising  
“ up along the longitudinal brace or keelson when the boat is  
“ closed, and falling down perpendicular to the keelson, or nearly  
“ so, when the boat is open out.”

Air chambers or cork may be employed to secure buoyancy.

[Printed, 1*s*. Drawings.]

A.D. 1855, February 24.—N° 413.

**RUSSELL, JOHN SCOTT.**—“An improvement in the construction of ships or vessels to facilitate the use of water as ballast.” This improvement consists in “constructing a ship or vessel with a central or midship compartment or hold, formed by strong transverse water-tight bulkheads, and closed in at top with an iron deck, either covered or not with wood, having, however, a hatchway capable of being closed water-tight. At the upper part of this compartment or hold is a rising pipe, by which water may be filled by a pump or otherwise into the hold or compartment above the line of flotation of the ship or vessel, there being a hole in the bottom of the ship or vessel, with a plug or valve to admit water to flow in up to the water line, and by reason of their having a rising pipe the water may be filled above the height of the hold or compartment, by which the water ballast will be kept from movement in the compartment or hold. By this mode of constructing a compartment or hold at or near the midships, water ballast may be more advantageously and conveniently employed when cargo cannot be obtained, and yet when cargo is obtained it may be as conveniently stowed as in an ordinary hold of a ship or vessel, and such means of carrying water as ballast will be found very convenient for carrying fresh water to a fleet of ships at sea.”

[Printed, 3d. Drawings.]

A.D. 1855, March 5.—N° 483.

**PAINE, LEWIS JAMES, and RYAN, JOHN.**—“Improved portable utensils, such as buckets, canteens, baths, and other annular waterproof articles for containing liquids; also applicable for portable life boats, buoys, or landmarks, and other compressible articles.” This invention consists in making the said vessels, utensils, and articles of “india-rubber, leather, cloth, or other elastic or non-elastic liquid-impervious material, self-supporting and self-adjusting, in the form or shape required by a skeleton, spiral, or other spring or springs.”

[Printed, 3d. No drawings.]

A.D. 1855, March 8.—N° 526.

**HERBARD, JOHN.**—(*Provisional protection only*).—The invention consists “of portable floating vessels with moveable water-tight

“ decks, sides, ends, and bottoms, and sliding or folding frames,  
“ platforms, stays, and supports, the whole being made and fitted  
“ together in sections composed of and separating into duplicate  
“ parts, designed for forming a portable extending pier, bridge, or  
“ platform for facilitating the embarking and disembarking pas-  
“ sengers, troops, cattle, stores, or merchandize, or for effecting  
“ a passage or forming a roadway across water; the said sections  
“ and duplicate parts being also designed and intended for forming  
“ works or buildings of defence, shelter, or stores on land, and  
“ also adapted for forming waggons or other vehicles. Each  
“ vessel, structure, or vehicle can be fitted together or separated  
“ with facility and dispatch, and packed together so as to occupy  
“ a comparatively small space for shipment or removal when not  
“ in use.”

[Printed, 3d. No drawings.]

A.D. 1855, March 19.—N° 609.

HOWSON, RICHARD.—(*Provisional protection only.*)—“ Im-  
“ proved means of increasing the motive effect of screw pro-  
“ pellers, and of diminishing resistance to motion in vessels  
“ propelled.” The improvements in vessels consist in an im-  
proved shape of entrance or bow-lines, so that “ if a cross section  
“ of the vessel be taken at any part between the stem and the  
“ midship section, the lines bounding the submerged portion will  
“ consist for the most part of vertical lines cutting horizontal  
“ lines at right angles, or of vertical lines cutting the lines of  
“ midship section, the angles of intersection in both cases being  
“ merely rounded off. The resulting form is such as to confine  
“ the resistance which the vessel encounters when in forward  
“ motion almost entirely to lateral resistance; the resistance to  
“ vertical pressure, or that which gives the vessel a tendency to  
“ rise, being reduced to as small a quantity as possible.” And  
in joining together a series of canal boats having convex bows and  
concave sterns, in order to diminish the resistance.

[Printed, 3d. No drawings.]

A.D. 1855, March 22.—N° 639.

RUSSELL, JOHN SCOTT.—(*Letters Patent void for want of final specification.*)—The object of this invention is to construct iron built

ships in such manner as to apply at the upper parts large and thick plates or masses of iron, so that iron-built ships for war purposes may be thereby rendered ball and shell proof. "For this purpose, "in building an iron ship I construct at intervals transverse frames, "each frame being an open frame or skeleton of a bulkhead "made with horizontal beams to support the deck or decks, "which frames may, when bulkheads are required in the localities "where they are used, be plated and made close. Such frames "or skeletons are connected at all parts, so as to be capable of "standing alone, and of offering great strength to the body of "the ship. These transverse frames are connected together by "means of angle iron bars running in a direction fore and aft of "the ship. On the outside (from the keel nearly up to the line "of floatation) of the frame of a ship thus constructed the plates "of iron are to be rivetted to each other; then, in place of continuing the plating on the outside, the frame of the ship is "constructed in such manner that the plates are rivetted to each "other, and to the inside of the horizontal bars of the framing, "so that the horizontal frames are outside of the plating of the "ship, and there will thus be formed recesses to receive the large "sheets or masses of iron which are introduced into the same, "and retained there by suitable fastenings; but it is preferred "that these masses should not be rigidly fastened to the ship, "but have wood or elastic material behind them, and thus each "mass or plate may, so to speak, act as an anvil to receive the "shock of a ball or shell."

[Printed 3d. No drawings.]

A.D. 1855, March 27.—N° 678.

GETTY, JOHN.—(*Letters Patent void for want of final specification*)—This invention relates to a novel mode of using iron in constructing the frames or ribs and other main parts of ships, chiefly those which are to be planked with wood, and require the employment of copper bolts for holding the planks in place, the main object being to avoid all contact between the iron and the copper bolts, and consequently to prevent a destructive galvanic action being set up between the two metals. "To give strength "to ships, I plate the opposite sides of the timbers with iron, "and secure the plates together by bolts which pass through the "iron and the wood, and thus I form compound ribs or frames of

“ considerable stiffness, which will permit of the copper bolts for  
“ securing the planking being inserted therein without coming in  
“ contact with the iron. For the purpose of facilitating the build-  
“ ing of vessels upon this compound principle, I propose that the  
“ width of the iron plates shall be in general less, say, by about  
“ two inches, than the depth of the timbers to which they are  
“ applied, to admit of the ribs being chamfered off to any required  
“ angle to suit the curve of the vessel. This mode of strengthening  
“ ships’ timbers I propose to employ in constructing the keels,  
“ stems, and stern posts, frames or ribs, keelsons, sister keelsons,  
“ and bilge keelsons, stringers, and clamps of ships.”

[Printed, 3*d*. No drawings.]

A.D. 1855, March 30.—N<sup>o</sup> 706.

PARNELL, HENRY WILLIAM.—(*Provisional protection only*).—  
An improvement “in the construction of ships and boats, so as  
“ to increase their buoyancy and diminish their rolling motion.”  
This consists in building or attaching “to a ship’s side at the  
“ water line a strong ledge, or wing, or platform, of any breadth  
“ that shall be deemed adviseable, level with the water, on which  
“ the ship will rest when properly trimmed.”

[Printed, 3*d*. No drawings.]

A.D. 1855, April 3.—N<sup>o</sup> 743.

TOOTH, WILLIAM HENRY.—“Certain improvements in the  
“ construction of floating vessels, and in the machinery and  
“ steam signals connected therewith, and in the application  
“ thereof to other purposes.” The improvement in the construc-  
tion of vessels consists in so forming their hulls as to reduce their  
sectional areas, and enable the superficial areas of the discs of  
the screws, to be in greater proportion to the sectional areas of the  
vessel than they have hitherto been constructed. This is to be  
accomplished by forming the vessels in two distinct compartments,  
the upper portion being like a wide shallow boat, from which  
is suspended a deep well the whole length of the vessel, but  
only wide enough to contain the machinery.

There are also improvements “in arranging the machinery and  
“ altering the steam whistle and making them suitable to the  
“ vessel ;” in the means of receiving the thrust or pressure from

the screw shaft, and of feathering the screw blades, so that they may offer little resistance to the water when the vessel is under canvas; and in the construction of boiler tubes.

[Printed, 1s. Drawings.]

A.D. 1855, April 5.—N<sup>o</sup> 761.

**GOODYEAR, CHARLES.**—"Improvements in self-inflating pontoons and life preservers." The pontoon is made of india-rubber or waterproof fabrics, in a series of compartments or chambers, each chamber being distinct and separate from the others, so that in case one is perforated the rest remain air and water-tight. The partition between the several compartments is formed of a plate or panel of "india-rubber whalebone," or stiff waterproof partition, the object of the whalebone or partition being to prevent the pontoon from collapsing laterally, while it is distended lengthwise by a spar of wood. Each compartment has a tube or passage, by which the pontoon is self-inflated when drawn out. Loops or rings are attached to the pontoons at each end of every compartment, by which they may be fastened to spars or boats, or lashed together to form rafts or bridges. The life preservers are made in the same way as the pontoons, but without rings and loops to the separate chambers.

[Printed, 6d. Drawings.]

A.D. 1855, April 11.—N<sup>o</sup> 795.

**OUDRY, LÉOPOLD, and OUDRY, ALPHONSE.**—"The invention consists in various methods and manipulations for covering articles of cast or sheet iron, lead, zinc, and other metals, and also articles of wood with a thick and adhering layer of copper, zinc, lead, or other metal for protecting the same from oxidation and destruction." "To cover the bodies of vessels, I can operate upon the whole piece when entirely finished without any deposit being previously made upon the separate parts. For that purpose I operate successively upon the internal surface of the shell or body of the boat by means of electrochemical baths contained in the interior, commencing, however, with baths for scouring and cleansing the different parts; I cover the external surface with a layer of metal by placing the shell or body in the middle of a basin, in which I cause the

“ different baths to arrive successively from separate reservoirs  
“ where they are kept, and to which they are afterwards sent back  
“ after each operation. This basin should be in the vicinity of a  
“ navigable river, with which it should be put in communication,  
“ and isolated by means of double doors, similar to a dock under-  
“ going repairs. In this case the vessel may be brought into the  
“ basin from the river, and go out after the operation is termi-  
“ nated, which enables me to act upon vessels’ bodies already  
“ in the water without taking them out. It is equally easy to  
“ deposit on the wooden hulls of vessels, in lieu of ordinary copper  
“ sheathing, an adhering thickness of metal obtained by means of  
“ electricity. To effect this object it is first necessary to clean the  
“ hull and then cover it with a slight layer of varnish or fatty  
“ body. To enable it to be metallised, barbed copper pegs are  
“ driven in at different parts of its surface. These pegs become  
“ even with the metal, which, when the hull is exposed to an  
“ electro-chemical bath, will be deposited uniformly over all its  
“ parts, and will protect the wood in a permanent and efficient  
“ manner.”

[Printed 4d. No drawings.]

A.D. 1855, April 18.—N° 860.

HARVEY, HENRY.—(*Provisional protection only.*)—This inven-  
tion consists in the application of cork, either in bark, shavings,  
or cuttings, to the manufacture of beds, mattresses, pillows,  
cushions, and seats, with or without waterproof coverings, appli-  
cable for military, naval, hospital, travelling, domestic, and other  
purposes. Also in its use for life buoys, “rafts and attachees to  
“ boats or other vessels ;” “boats or other vessels *per se* or as the  
“ lining or casing of boats or other vessels,” whereby additional  
safety and buoyancy are obtained.

[Printed, 3d. No drawings.]

A.D. 1855, April 19.—N° 875.

JOHNSON, JOHN HENRY,—(*a communication.*)—The inven-  
tion relates to the manufacture of certain articles of india-rubber,  
gutta-percha, or compounds thereof, after the methods described  
by Thomas Hancock and others, in former Patents. It consists

in the manufacture of these articles by first moulding them while in a soft state, and then submitting them to a high degree of heat in steam heaters, or to the action of a sulphur bath.

" Sheathing for ships, veneers for furniture, and thin sheets " for any other purpose may be made upon this principle."

[Printed, 4d. No drawings.]

A.D. 1855, May 12.—N° 1071.

HERDMAN, JOHN.—"Improvements in the manufacture of " wrought-iron plates, adapted for ship building and other pur- " poses for which strength and lightness are required." Wrought iron plates, one surface of which is flat, and the other furnished with a series of ribs, bosses, or projections, of angular, rectangular, or other suitable form, are manufactured by rolling or otherwise. The ribbed or bossed surfaces of two such plates, are then heated to a welding heat, and welded together by one or more blows of a powerful hammer or hammers, or by passing them between rolls, or otherwise pressing them together. The ribs, bosses, or projections on one plate are thus welded to those on the other plate. A compound hollow or cellular plate is thus obtained, which possesses great strength in proportion to its weight, and is well adapted for the construction of large iron girders, and for ship building, and other purposes. "For constructing hollow or " cellular plates of great thickness, I employ two plates, similar " to those above mentioned, and I place between them one or " more plates with corresponding ribs, bosses, or projections on " both surfaces, and I weld the whole together. For constructing " thinner hollow or cellular plates, I sometimes employ one plain " plate, and one plate with ribs, bosses, or projections on one of " its surfaces, and I weld these two together." When greater solidity is required at the edges or other parts of the plates, iron bars are to be inserted at such parts and welded in.

[Printed, 6d. Drawings.]

A.D. 1855, May 12.—N° 1072.

ADAMS, WILLIAM BRIDGES.—"Improvements in the construction and propulsion of vessels for navigation moved by " internal power." The improvements consist,— "First, in con-

“ structing metallic vessels in two shells or thicknesses with spaces  
“ between, whether for bottom or sides or decks, or the parti-  
“ tions known as bulkheads, the shells being kept at the requisite  
“ distance from each other, either by bolts screwed at each end  
“ into the plates, or by bolts of the ordinary kind, with metallic  
“ tubes or distance pieces round them or near them at the proper  
“ length to keep the plates apart, or with bolts rivetted at each  
“ end on to the plates, or by rivets with the ends of smaller  
“ diameter, so as to form shoulders, or by similar means, such  
“ being an improvement in the usual mode of cellular construc-  
“ tion with close partitions, and the intermediate spaces may at  
“ the bottom be filled with pitch, or tar, or bitumen, or cement,  
“ or asphalte mixed or not with stones as ballast, the preferable  
“ material being an elastic bitumen.” Another portion of the  
space may be used for the storage of fresh water, and other por-  
tions may be simple air spaces, and the bolts will serve for the  
purpose of climbing, if the spaces be wide, when it is necessary to  
examine the interior.

“ Secondly, the construction of shafts for paddle wheels and  
“ propellers either solid or hollow, by uniting parts together  
“ heated by gas heat or other flame heat, and compressed by  
“ hydrostatic or other pressure ; also uniting the joints of the iron  
“ planking by gas heat for welding and brazing, so that the  
“ operations may be performed without a forge fire.”

“ Thirdly, the application of caoutchouc, either vulcanized or  
“ otherwise treated to improve its elasticity or otherwise, for the  
“ purpose of giving elastic yielding and reaction to paddle wheels  
“ and propellers or toothed wheels, or the application of volute, or  
“ spiral, or disc, or hoop springs of steel for the same object.”

“ Fourthly, lighting vessels by night, or in fogs, or for other  
“ purposes, with gas formed by dropping oil or fat into heated  
“ pipes or by retorts placed in the furnaces.”

“ Fifthly, the application of air chambers or strong air or gas  
“ reservoirs to be worked by the engine, and the air or gas highly  
“ compressed, so that such air or gas will serve either to blow  
“ a loud signal trumpet or other instrument with regular or  
“ irregular notes, or can be applied to throw a shower of shot  
“ from a gun.”

A.D. 1856, May 17.—N° 1116.

**JOHNSON, WILLIAM**.—(a communication).—"Improvements in the manufacture, treatment, and application of oily, resinous, and gummy substances and soaps." This invention relates to the mixing of various substances with gutta percha, and india-rubber or caoutchouc, for the purpose of forming new substances. The inventor states that pease flour, mixed with resins, glue, and gutta-percha, and with a portion of gutta percha added thereto, produces compounds or substances suitable for use instead of wood and iron in ship building, and for floating batteries and other situations; and that shields of iron or steel wire, covered with these hard gutta-percha compounds, are suitable for use in war, as defensive coverings against even Minie balls.

[Printed, 4d. No drawings.]

A.D. 1855, May 22.—N° 1151.

**SCOTT, HENRY EMMANUEL**.—"Improvements in ships and other floating vessels." The improvements consist, "first, in making the horizontal sections of a ship or vessel of two suitable segments of a common parabola, so that the vertex of each shall be mutually in the same point at the bow, whilst their other extremity shall be mutually in the same point at the stern, and their extreme breadth together shall be equal to that of the ship or vessel at the corresponding depth or height, the usual method being to place the vertex of the parabolic segments in the opposite sides of the ship; and this construction of these sections may extend either throughout the entire height or depth of the ship, or only to an assigned height above the keel, as may be suitable; secondly, in arranging the extreme widths of the several horizontal sections of the ship in such a manner that those above are in advance of or are ahead of those beneath, instead of collecting them in one vertical transverse plane commonly called the 'midship section.'"

"By this principle of construction, the lengths and areas of the several horizontal sections may be equal to those of a ship of any ordinary construction, whilst the extreme widths will be less than by adopting an assigned midship section, as is usual, consequently a less lateral displacement of the water in

“ the ship’s progress would ensue, and consequently less power  
“ would be required to propel a ship so constructed.”

[Printed, 1s. Drawings.]

A.D. 1855, May 25.—N° 1182.

GREENHOW, THOMAS MICHAEL. — (*Provisional protection only.*)—“ I apply a glassy or siliceous coating, covering, or varnish  
“ to the bottoms and sides of iron ships. This coating is com-  
“ posed of ground glass, borax, and soda, or other vitreous  
“ mixture capable of being fused upon the surface of the iron.  
“ I cover the plates used in the construction of iron ships with  
“ thin plates of iron, coated with the siliceous or glassy surface in  
“ such manner as to include the rivet heads, and protect the  
“ whole of the bottoms and sides of such ships up to the water  
“ mark, or to a greater or less extent, as may be required; the  
“ bottoms and sides are thus protected from barnacles and other  
“ injuries.”

[Printed, 3d. No drawings.]

A.D. 1855, June 4.—N° 1268.

GODEFROY, PETER AUGUSTIN.—This invention consists “ in  
“ combining the shells of the fruit of the coco-nut tree,” “ in a  
“ finely ground or comminuted state with gutta percha in the manu-  
“ facture thereof, by which the quality of such material is con-  
“ siderably improved.” A coarse variety of this material is  
adapted for lining ships, &c.

[Printed, 3d. No drawings.]

A.D. 1855, June 4.—N° 1275.

NEWTON, WILLIAM EDWARD.—(*a communication.*)—“ An im-  
“ proved construction of ship’s auger.”

“ The object of this invention is to avoid the inconvenience  
“ arising from the breaking of the cutting part or bit of ship’s  
“ augers. To this end, the inventor attaches to the ordinary  
“ auger stock a removable bit, which when damaged or broken  
“ may be taken off and replaced by another. In order to fit the  
“ stock to receive the bit, it is cut off square at the end, and in  
“ the end of the stock a projecting pin is firmly fixed, which pin  
“ is intended to enter a hole made in the under side of the bit,

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and steady it in its place when attached to the stock. Through the end of the stock a hole is bored to receive a screw, which passes through the bit and secures it to the stock."

[Printed, &c. Drawings.]

A.D. 1855, June 13.—N<sup>o</sup> 1352.

**BETTELEY, JOSEPH.**—"This invention has for its object an improvement in the manufacture of iron knees for ship building." In a former Patent, No. 2343 (1854), the use of angle and trough iron, in the manufacture of iron knees for ship-building, was described, in which cases the iron was rolled parallel. The present improvement consists in rolling or forming iron for iron knees, tapering or wedge shape, having projecting ribs intermediate of the widths of such iron, or at the edges thereof, and also forming solid projections at intervals, whereby the quantity or mass of iron near the bends, and, if desired, at other parts, is greater in each iron knee for a ship, than was the case in the former patent knees.

[Printed, &c. Drawings.]

A.D. 1855, June 15.—N<sup>o</sup> 1366.

**CLAY, WILLIAM.**—"The invention consists in applying angle iron, T iron, double T iron, and single or double grooved or channel bar iron, rolled in such a manner as to taper or gradually increase or diminish in sectional area from one point of its length to another, so that one part may be made thicker and stronger than another," to purposes where great strength or stiffness is required, as in "ships' knees, beams for ships or other structures, corner pieces for railway waggons, or any wooden structure where two pieces or beams of wood are mortised or attached to each other, and form an angle or corner. Bar iron made in this manner may also be employed for wrought-iron beams or girders, or ribs for wooden or iron ships, and also for making wrought-iron spokes for railway wheels."

[Printed, &c. Drawings.]

A.D. 1855, June 18.—N<sup>o</sup> 1385.

**BLANCHARD, THOMAS.**—"This invention consists in so conducting the process of bending wood or timber, that the piece of

wood or timber may be subjected to pressure on all its sides, during the process of bending, in place of simply being bent over a form, as has heretofore been the practice. By this means the wood or timber is prevented from swelling or bursting, as it is liable to do when bent without such support.

The apparatus employed consists of “a lever, which turns on a  
“ centre or axis; to this lever is attached a trough of the curve to  
“ which the wood is to be bent, one side of the trough being  
“ moveable, so that it may be pressed firmly against the surface  
“ of the wood by wedges. Underneath the lever before mentioned  
“ is a travelling-table, the distance of which from the curved form  
“ can be adjusted by a screw. The piece of timber to be bent is  
“ laid on a flexible band of metal placed on this table and  
“ clamped down thereon, so that it is pressed upon on all sides;  
“ one end of the timber is then clamped to the fore part of the  
“ curved trough on the lever, the flexible band of metal being  
“ taken hold of in the clamp as well as the timber. The other”  
end “of the timber butts against a block, acted on by a screw,  
“ which passes through lugs in the travelling table.” When this  
is arranged, the lever is drawn gradually down, during which  
operation the timber passes into the curved trough; the two ends  
of the piece are then connected together by a tie.

[Printed, 10*d*. Drawings.]

A.D. 1855, June 21.—N<sup>o</sup> 1422.

BIRCH, JAMES ROBERT.—(*Provisional protection only.*)—This invention consists in adapting to the bottom of a ship's boat, a self-acting hinged valve opening outwards, for discharging the water therefrom, in lieu of the detached plug hitherto employed.

[Printed, 3*d*. No drawings.]

A.D. 1855, July 5.—N<sup>o</sup> 1506.

FLAGG, SAMUEL GRISWOLD,—*a communication from Abijah R. Tewksbury.*—(*Provisional protection only.*)—“An improved  
“ folding boat.”

“The invention consists in an improved method of constructing  
“ a boat, viz., by attaching its sides and ends to its bottom by  
“ water-tight hinges, in combination with connecting the edges

" of the sides and ends by water-tight flexible gores of india-rubber cloth or other suitable material of such size & shape that the boat may be unfolded, or the sides and ends may be turned down into the same plane with the bottom, as may be desired."

[Printed, 2d. No drawings.]

A.D. 1855, July 17.—N° 1601.

**SALAVILLE, SCIPION**—"An improved apparatus for airing and preserving grain, seeds, apples, potatoes, hops, and other similar articles in granaries, warehouses, and ships."

The apparatus is composed of a series of cylindrical tubes of wrought iron, called "generators," perforated with numerous small triangular holes punched outwards. These generators are connected together by a series of smaller tubes of wrought iron, which are similarly perforated with triangular holes. The generators are each connected at one end with an air-tight receiver, and the other end is closed. A strong current of air is maintained through the apparatus by means of a number of separate fans or blowers set upon the same shaft, which is driven by any suitable prime mover. The receiver, with its blowers, may be placed upon the deck, and the tubes in the bottom of the vessel, a connecting pipe descending from the receiver to the generators.

[Printed, 2d. Drawings.]

A.D. 1855, July 20.—N° 1646.

**DESCHAMPS, CASIMIR, and VILCOQ, CHARLES**.—"A free diving boat."

This invention relates to a diving boat of an entirely new form, and which may be freely directed backwards and forwards at the surface or at the bottom of the water, by means of a screw or helix and a rudder, worked by hand, from within the boat. The operator is allowed to breathe freely, and to remain and work under the water for several hours by the use of compressed air contained in reservoirs. This compressed air is diffused at will by means of a manometer in the boat, from which the assistant sucks it through a breathing apparatus, and then drives it out through a pipe. The

operator can see the ground on which he works through the glass partition of the lantern; he is also allowed to grasp external objects by means of sleeves. He may cause the boat to rise up and float a little beneath the surface of the water, and may there regulate its buoyancy by means of two gutta-percha hoses or chambers, which are filled with compressed air when the boat is desired to rise, the air being let out when the boat is desired to sink. These two hoses are placed at the back and front parts of the boat in outside galleries, with nets for protecting the hoses, and for holding and carrying the working tools. There is also a water-tight chamber, which contains electric batteries for the purpose of feeding a lamp. By means of this boat investigations and discoveries may be made at the bottom of the sea. It may be used also for raising or destroying foundered vessels, for searching fire ships and like incendiary engines, for reconnoitring, &c.

[Printed, 6*d.* Drawings.]

A.D. 1855, July 23.—N° 1667.

GOODYEAR, CHARLES.—(*Provisional protection only.*)—This invention has for its object, a mode of employing hard compounds of india-rubber, in the construction of boats and other vessels.

It being well known that compounds consisting of india-rubber and sulphur, with or without other matters, when subjected to high temperatures, are changed into a hard substance; and that such substances may be combined with woven fabrics or with wire cloth, and be otherwise strengthened with metal; it is proposed to combine and cement together sheets and parts of such compounds of india-rubber into the form of a boat or vessel, before subjecting the india-rubber compound to heat; then, when a boat or vessel has been so formed or built up, and the parts combined or cemented together and retained in the desired form, it is to be subjected to heat, so as to produce the change in the india-rubber compound above mentioned.

[Printed, 3*d.* No drawings.]

A.D. 1855, July 24.—N° 1673.

WESTWOOD, JOSEPH, and BAILLIE, ROBERT.—“Improve-  
ments in preserving timber-built ships, also timber or wood and

" wrought iron used in situations exposed to the action of water  
" or of weather."

The invention consists in applying to such wood or iron a preparatory coating of black varnish, or other composition having similar properties thereto, and afterwards a coating of asphalte or bituminous composition, whereby the latter will be made to adhere with increased tenacity to the surface to which it is applied.

[Printed, 3d. No drawings.]

A.D. 1855, July 26.—N° 1695.

BEATTIE, JAMES.—" A combination or contrivance of a folding  
" mattress (with or without a tent attached), hut, ambulance for  
" conveyance of wounded or sick persons, pontoon, raft, and  
" boat, portable cistern, and bath."

It consists of " a mattress made in five compartments or divisions, that is to say, one centre piece, which may be subdivided, " two side pieces and two end pieces, all connected in a manner " to allow of its being adapted to the required forms for the " several purposes above mentioned." The materials used in the construction or manufacture of the cases or coverings, both external and internal, may be canvass, or any other material or substance capable of being rendered waterproof; and the stuffing may be of any substance or fibre having the qualities of lightness, elasticity, and buoyancy.

[Printed, 2d. Drawings.]

A.D. 1855, August 6.—N° 1778.

GILBEE, HENRY,—(*a communication from Monsieur Jacoreneo.*) The invention consists " in the employment of waterproof cloth " in combination with a wooden frame for the construction of " flat-bottomed boats applicable to the navigation of rivers and " shallow waters."

" The waterproof cloth takes the shape of the frame of the " boat, and is fixed to it by means of ropes, which serve to " maintain it sufficiently stretched " to resist the pressure of the " surrounding water. When the nature of the cargo to be carried " does not allow the weight to be equally distributed on the " bottom of the boat, boards are placed on the cloth to prevent " the latter from rising."

[Printed, 3d. Drawings.]

A.D. 1855, August 27.—N° 1937.

SAUTELET, EMILE CONSTANTIN FRITZ.—The invention consists in “the manufacture of an impermeable cloth or fabric  
“ by the combination of loose or unwoven wool or hair with  
“ caoutchouc, or gutta percha, or other similar elastic or flexible  
“ gum,” adapted for sheathing ships and other purposes.

[Printed, 3d. No drawings.]

A.D. 1855, September 4.—N° 1997.

TAYLOR, JOHN GEORGE.—(*Provisional protection only.*)—This invention relates “to the application and use of the metal or  
“ metallic earth aluminum, otherwise aluminium, as a material for  
“ coating, covering, or plating metallic bodies or surfaces,” including ships’ sheathing. “It is intended to apply the aluminium  
“ for this purpose either by the action of electricity, magnetism,  
“ or galvanism, or by the old system of plating with sheets.”

[Printed, 3d. No drawings.]

A.D. 1855, September 5.—N° 2010.

PALMIÉRI, AGOSTINO, and FERRARI, JEAN BAPTISTE,—(*a communication from J. B. Paganini*).—“A new system of  
“ construction of ships or vessels.”

The invention consists “in placing an ordinary hulk upon a  
“ suitable frame, to which is attached in the direction of the keel  
“ a series of six or more hollow air-tight cylinders, composed of  
“ wood or metal, the axes of which work in suitable bearings.” The cylinders are furnished, if necessary, with floats or paddles upon their circumference, and are actuated by suitable machinery. The cylinder placed at the stern of the vessel answers the purpose of a helm, being constructed so as to turn in any direction.

These cylinders “support as well as propel the vessel, which  
“ differs from those of ordinary construction, in having no keel.”

[Printed, 10d. Drawings.]

A.D. 1855, September 5.—N° 2012.

PEACOCK, GEORGE.—“Improvements in ship-building.” The improvements consist in applying a horizontal keel to the ordinary fixed vertical keel, in such manner that the horizontal keel may extend on either side beyond the ordinary keel; and as regards iron ships, in enabling a false keel of wood to be applied thereto,

the principal object being to enable ships and vessels to keep a better wind, and to prevent leeway and rolling.

Also, in constructing "the stern of an iron ship with a hollow or boxed stern post, tapering gradually below the line of the screw shaft towards the junction of the keel, and to convey a bent pipe from a water tank or reservoir for the supply of the boilers through such hollow stern post; the bent pipe is passed out of the ship or vessel above the deep load line, and " is led down, so that its outlet may be below the light water line; the pipes by which the water is blown from the boilers to be conducted through the said stern post in like manner, so as to blow off either through the outer bend of the first-mentioned pipe or by separate pipes. These pipes are provided with cocks for the purpose of closing the passages when necessary."

[Printed, 1s 10d. Drawings.]

A.D. 1855, September 7.—N<sup>o</sup> 2027.

McINTYRE, JOHN.—This invention relates "to a peculiar construction and arrangement of self-acting caulking machine for caulking decks, ceilings, or floors, when oakum or other material as a substitute is used, whether such decks, ceilings, or floors be for wood or iron ships." It consists of a cast-iron carriage, travelling on four running wheels, and carrying a transverse shaft, fitted with a spur wheel and cams, by which the caulking tools are driven. "These tools are guided on suitable wrought-iron standards or brackets over the seams to be caulked. The caulking tools are in the form of wheels with sharp edges, and are made to guide the machine in the line of the seams, whilst the carrying wheels of the machine are made to guide the oakum or material employed into its place in the seams. The machine may be fitted with a pitch kettle for paying the seams with pitch as fast as they are caulked. One or more seams may obviously be caulked at one time by simply increasing the number of tools and caulking hammers. The machine is moved forward by a rope or chain, fitted to any portion of the ship or other surface to be caulked ahead of the machine, whilst the other end of this rope or chain is wound round a barrel on one of the shafts of the machine. The whole machine may, however, be made to work by steam if found desirable."

[Printed, 10d. Drawings.]

A.D. 1855, September 15.—N° 2090.

FORD, ALFRED.—“Improvements in preparing solutions of  
“ caoutchouc, gutta-percha, and like gums for waterproofing and  
“ other useful purposes.” The improvements consist “in  
“ dissolving india-rubber, gutta-percha, and like gums in oil of  
“ turpentine peculiarly treated for that purpose, and in applying  
“ such solution as a cement, varnish, paint, or waterproofing  
“ agent, or simply to soften such substances for general pur-  
“ poses.”

The solutions may be combined with oxides or salts of copper, singly or together, to be employed as a coating for iron ships' bottoms.

[Printed, 3d. No drawings.]

A.D. 1855, October 8.—N° 2246.

HENRY, JAMES HARVEY.—(*Provisional protection only.*)—  
“ This invention has for its object the constructing of floating  
“ vessels for carrying goods and passengers in such manner that  
“ the body of the vessel shall be supported above the surface of  
“ the water by means of hollow cylindrical floats, with curved  
“ ends, free to revolve on their axles, such vessels being, by pre-  
“ ference, propelled by paddle wheels, applied on either side of  
“ the body of the vessel.” “To the under sides of the body  
“ of the vessel the hollow cylinders are applied, preferring  
“ them to be of sheet metal, their axles being received in suitable  
“ side bearings, so that the axles may run free when the vessel is  
“ being propelled, and it is preferred that the hollow cylinders  
“ should only be immersed to the extent of about one-third their  
“ diameter.” “The guiding is, by preference, to be accom-  
“ plished by a rudder or rudders about midships, in order that  
“ the vessel may go either end forwards, but other means of  
“ guiding may be resorted to. By such a construction of vessel  
“ it is anticipated that greater velocity will be obtained with com-  
“ paratively small power.”

[Printed, 3d. No drawings.]

A.D. 1855, October 31.—N° 2425.

LAWRIE, JAMES GRAY.—“ This invention has for its object  
“ the construction of iron ships, with a view to their being more  
“ suitable for using water as ballast. For this purpose a ship is

" built with one or more water chambers in a direction fore and  
 " aft the ship, and occupying a greater or less length below deck  
 " and in the holds thereof, according to circumstances." In  
 order that the water ballast chambers may be suitable for carrying  
 cargo, vertical doors are formed in the sides, or ends, or both,  
 which are made suitable for being closed watertight. These  
 chambers may be separated by a central passage way, and may be  
 sub-divided into several smaller chambers, which may have doors  
 into each other and into the longitudinal space between them.  
 The upper parts of the chambers are to be closed in watertight  
 with iron plates, planked over and made suitable for receiving  
 cargo on the top, and between the top and the deck above.  
 Provision is to be made for filling any or all the compartments  
 with water, and for emptying them by pumps.

[Printed, 10d. Drawings.]

A.D. 1855, November 7.—N<sup>o</sup> 2513.

BOUSFIELD, GEORGE TOMLINSON,—(*a communication from Otis Tufts.*)—" This invention has for its object the manufacture  
 " of large wrought-iron shafting suitable for steam boats and  
 " other purposes where great strength is required." It consists  
 in " constructing each shaft of several pieces, which are not  
 " welded together, but are caused to retain the form of a shaft  
 " by means of being fitted together and bound by strong hoops  
 " or rings of wrought iron. For this purpose a central bar is  
 " used, of comparatively small diameter as compared with the  
 " intended diameter of the shaft, having around it several sectional  
 " pieces which make up the diameter desired. The sectional  
 " pieces and the internal bar are each forged and formed with  
 " care, which can readily be accomplished with soundness by  
 " reason of the comparatively small dimensions, and the sides  
 " thereof are made with grooves and projections, in order that  
 " they may go together with accuracy, and then be bound together  
 " at intervals in the length, or from end to end." The interior  
 or central part may in some cases be hollow.

[Printed, 6d. Drawings.]

A.D. 1855, November 27.—N<sup>o</sup> 2676.

JOHNSON, JOHN HENRY,—(*a communication from Messrs. Jackson Brothers, Petin Gaudet, and Company*)—" Improvements  
 in sheathing ships." The invention consists " in the employment

“ of plates of cast or shear steel for the purpose of sheathing or  
“ covering ships’ bottoms in place of the sheets of copper, zinc,  
“ Muntz metal, or other material at present employed for that  
“ purpose.” The sheets of steel are rolled out to the desired  
size and thickness, and are attached to the ship’s surface in the  
ordinary manner.

[Printed, 8d. No drawings.]

A.D. 1855, November 29.—N° 2698.

NORTH, GEORGE.—“ An improved portable apparatus for sup-  
“ porting and folding heads, tilts, coverings, and awnings of wheel  
“ carriages, marine vessels, goods, and ways,” the folding of which  
is effected by the supports sliding, and being jointed laterally.

[Printed, 10d. Drawings.]

A.D. 1855, December 8.—N° 2776.

TEVENDALE, ANDREW.—(*Provisional protection only.*)—“ Im-  
“ provements in propelling, and in the construction of steam or  
“ other vessels,” which are as follows :—“ The vessel, instead of  
“ floating in the water, rests on a framework under which are  
“ fitted two or more water-tight drums or cylinders, the air in  
“ which supports the whole. Rotatory motion being communi-  
“ cated to the drums or cylinders (on which there are radial float  
“ boards) by a steam engine or other apparatus in the vessel, a  
“ more rapid motion is produced by a given power than is other-  
“ wise to be obtained.”

[Printed, 3d. No drawings.]

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## 1856.

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A.D. 1856, January 1.—N° 4.

NEWTON, ALFRED VINCENT, — (*a communication from  
François Garnier.—Provisional protection only.*)—“ A novel system  
“ of propulsion, applicable to land and water.” The invention re-  
lates, firstly, to a novel system of locomotion upon land, wherein  
compressed air (or water) is employed as the propelling power,

“ built with one or more water chambers in a direction fore and  
 “ aft the ship, and occupying a greater or less length below deck  
 “ and in the holds thereof, according to circumstances.” In  
 order that the water ballast chambers may be suitable for carrying  
 cargo, vertical doors are formed in the sides, or ends, or both,  
 which are made suitable for being closed watertight. These  
 chambers may be separated by a central passage way, and may be  
 sub-divided into several smaller chambers, which may have doors  
 into each other and into the longitudinal space between them.  
 The upper parts of the chambers are to be closed in watertight  
 with iron plates, planked over and made suitable for receiving  
 cargo on the top, and between the top and the deck above.  
 Provision is to be made for filling any or all the compartments  
 with water, and for emptying them by pumps.

[Printed, 10d. Drawings.]

A.D. 1855, November 7.—N° 2513.

BOUSFIELD, GEORGE TOMLINSON,—(*a communication from  
 Otis Tufts.*)—“ This invention has for its object the manufacture  
 “ of large wrought-iron shafting suitable for steam boats and  
 “ other purposes where great strength is required.” It consists  
 in “ constructing each shaft of several pieces, which are not  
 “ welded together, but are caused to retain the form of a shaft  
 “ by means of being fitted together and bound by strong hoops  
 “ or rings of wrought iron. For this purpose a central bar is  
 “ used, of comparatively small diameter as compared with the  
 “ intended diameter of the shaft, having around it several sectional  
 “ pieces which make up the diameter desired. The sectional  
 “ pieces and the internal bar are each forged and formed with  
 “ care, which can readily be accomplished with soundness by  
 “ reason of the comparatively small dimensions, and the sides  
 “ thereof are made with grooves and projections, in order that  
 “ they may go together with accuracy, and then be bound together  
 “ at intervals in the length, or from end to end.” The interior  
 or central part may in some cases be hollow.

[Printed, 6d. Drawings.]

A.D. 1855, November 27.—N° 2676.

JOHNSON, JOHN HENRY,—(*a communication from Messrs.  
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“ covering ships’ bottoms in place of the sheets of copper, zinc,  
“ Muntz metal, or other material at present employed for that  
“ purpose.” The sheets of steel are rolled out to the desired  
size and thickness, and are attached to the ship’s surface in the  
ordinary manner.

[Printed, 3d. No drawings.]

A.D. 1855, November 29.—N<sup>o</sup> 2698.

**NORTH, GEORGE.**—“ An improved portable apparatus for sup-  
“ porting and folding heads, tilts, coverings, and awnings of wheel  
“ carriages, marine vessels, goods, and ways,” the folding of which  
is effected by the supports sliding, and being jointed laterally.

[Printed, 10d. Drawings.]

A.D. 1855, December 8.—N<sup>o</sup> 2776.

**TEVENDALE, ANDREW.**—(*Provisional protection only.*)—“ Im-  
“ provements in propelling, and in the construction of steam or  
“ other vessels,” which are as follows:—“ The vessel, instead of  
“ floating in the water, rests on a framework under which are  
“ fitted two or more water-tight drums or cylinders, the air in  
“ which supports the whole. Rotatory motion being communi-  
“ cated to the drums or cylinders (on which there are radial float  
“ boards) by a steam engine or other apparatus in the vessel, a  
“ more rapid motion is produced by a given power than is other-  
“ wise to be obtained.”

[Printed, 3d. No drawings.]

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## 1856.

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A.D. 1856, January 1.—N<sup>o</sup> 4.

**NEWTON, ALFRED VINCENT,** — (*a communication from  
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“ of propulsion, applicable to land and water.” The invention re-  
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 " aft the ship, and occupying a greater or less length below deck  
 " and in the holds thereof, according to circumstances." In  
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 which are made suitable for being closed watertight. These  
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 sub-divided into several smaller chambers, which may have doors  
 into each other and into the longitudinal space between them.  
 The upper parts of the chambers are to be closed in watertight  
 with iron plates, planked over and made suitable for receiving  
 cargo on the top, and between the top and the deck above.  
 Provision is to be made for filling any or all the compartments  
 with water, and for emptying them by pumps.

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 " or rings of wrought iron. For this purpose a central bar is  
 " used, of comparatively small diameter as compared with the  
 " intended diameter of the shaft, having around it several sectional  
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 " pieces and the internal bar are each forged and formed with  
 " care, which can readily be accomplished with soundness by  
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" Muntz metal, or other material at present employed for that  
" purpose." The sheets of steel are rolled out to the desired  
size and thickness, and are attached to the ship's surface in the  
ordinary manner.

[Printed, 3d. No drawings.]

A.D. 1855, November 29.—N<sup>o</sup> 2698.

NORTH, GEORGE.—" An improved portable apparatus for sup-  
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" carriages, marine vessels, goods, and ways," the folding of which  
is effected by the supports sliding, and being jointed laterally.

[Printed, 10d. Drawings.]

A.D. 1855, December 8.—N<sup>o</sup> 2776.

TEVENDALE, ANDREW.—(*Provisional protection only.*)—" Im-  
" provements in propelling, and in the construction of steam or  
" other vessels," which are as follows:—" The vessel, instead of  
" floating in the water, rests on a framework under which are  
" fitted two or more water-tight drums or cylinders, the air in  
" which supports the whole. Rotatory motion being communi-  
" cated to the drums or cylinders (on which there are radial float  
" boards) by a steam engine or other apparatus in the vessel, a  
" more rapid motion is produced by a given power than is other-  
" wise to be obtained."

[Printed, 3d. No drawings.]

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## 1856.

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A.D. 1856, January 1.—N<sup>o</sup> 4.

NEWTON, ALFRED VINCENT, — (*a communication from  
François Garnier. Provisional protection only.*)—" A novel system  
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compressed air (or water) is employed as the propelling power,

" built with one or more water chambers in a direction fore and aft the ship, and occupying a greater or less length below deck and in the holds thereof, according to circumstances." In order that the water ballast chambers may be suitable for carrying cargo, vertical doors are formed in the sides, or ends, or both, which are made suitable for being closed watertight. These chambers may be separated by a central passage way, and may be sub-divided into several smaller chambers, which may have doors into each other and into the longitudinal space between them. The upper parts of the chambers are to be closed in watertight with iron plates, planked over and made suitable for receiving cargo on the top, and between the top and the deck above. Provision is to be made for filling any or all the compartments with water, and for emptying them by pumps.

[Printed, 10d. Drawings.]

A D. 1855, November 7.—N<sup>o</sup> 2513.

**BOUSFIELD, GEORGE TOMLINSON**,—(*a communication from Otis Tufts.*)—" This invention has for its object the manufacture of large wrought-iron shafting suitable for steam boats and other purposes where great strength is required." It consists in " constructing each shaft of several pieces, which are not welded together, but are caused to retain the form of a shaft by means of being fitted together and bound by strong hoops or rings of wrought iron. For this purpose a central bar is used, of comparatively small diameter as compared with the intended diameter of the shaft, having around it several sectional pieces which make up the diameter desired. The sectional pieces and the internal bar are each forged and formed with care, which can readily be accomplished with soundness by reason of the comparatively small dimensions, and the sides thereof are made with grooves and projections, in order that they may go together with accuracy, and then be bound together at intervals in the length, or from end to end." The interior or central part may in some cases be hollow.

[Printed, 6d. Drawings.]

A.D. 1855, November 27.—N<sup>o</sup> 2676.

**JOHNSON, JOHN HENRY**,—(*a communication from Messrs. Jackson Brothers, Petit Gaudet, and Company.*)—" Improvements in sheathing ships." The invention consists " in the employment

“ of plates of cast or shear steel for the purpose of sheathing or  
“ covering ships’ bottoms in place of the sheets of copper, zinc,  
“ Muntz metal, or other material at present employed for that  
“ purpose.” The sheets of steel are rolled out to the desired  
size and thickness, and are attached to the ship’s surface in the  
ordinary manner.

[Printed, 3*d*. No drawings.]

A.D. 1855, November 29.—N<sup>o</sup> 2698.

NORTH, GEORGE.—“ An improved portable apparatus for sup-  
“ porting and folding heads, tilts, coverings, and awnings of wheel  
“ carriages, marine vessels, goods, and ways,” the folding of which  
is effected by the supports sliding, and being jointed laterally.

[Printed, 10*d*. Drawings.]

A.D. 1855, December 8.—N<sup>o</sup> 2776.

TEVENDALE, ANDREW.—(*Provisional protection only.*)—“ Im-  
“ provements in propelling, and in the construction of steam or  
“ other vessels,” which are as follows :—“ The vessel, instead of  
“ floating in the water, rests on a framework under which are  
“ fitted two or more water-tight drums or cylinders, the air in  
“ which supports the whole. Rotatory motion being communi-  
“ cated to the drums or cylinders (on which there are radial float  
“ boards) by a steam engine or other apparatus in the vessel, a  
“ more rapid motion is produced by a given power than is other-  
“ wise to be obtained.”

[Printed, 3*d*. No drawings.]

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1856.

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A.D. 1856, January 1.—N<sup>o</sup> 4.

NEWTON, ALFRED VINCENT, — (*a communication from  
François Garnier.—Provisional protection only.*)—“ A novel system  
“ of propulsion, applicable to land and water.” The invention re-  
lates, firstly, to a novel system of locomotion upon land, wherein  
compressed air (or water) is employed as the propelling power,

and which is denominated Garnier's aerial railway. In applying the same principle to the propulsion of vessels on water, "the vessel is suspended in a rectangular tubular frame, to which it is attached by links in such a manner as to be capable of rising and falling therein. The vessel is provided at its lower part with an air chamber, and on compressed air being forced therein by means of a steam engine above, the vessel will be caused to rise in the frame; the air flowing through this chamber will make its exit at the back in larger quantity than in front, and will consequently propel the vessel forward. For this purpose an engine of only half the power required to work a screw will be required."

[Printed, 3d. No drawings.]

A.D. 1856, January 4. — N° 30.

BACH, HENRY.—"Improvements in the application of glass to decorative purposes." The invention consists, in the first place, in adapting and applying hollow glass pillars or facings, gilded or coloured at the back, to the decoration of cabins in vessels, &c.

And, in the second place, in adapting and applying fluted, corrugated, diapered, or otherwise suitably decorated sheet glass, gilded or coloured at the back, to such uses, either alone, or in combination with the hollow glass pillars or facings above referred to.

[Printed, 3d. No drawings.]

A.D. 1856, January 4.—N° 39.

BETTELEY, JOSEPH.—"An improvement in the rolling of iron for the making of ships' knees." The improvement consists in so forming the grooves or surfaces of the rolls used in rolling knee iron, as to produce one of the surfaces of each limb with a curved line or surface, instead of a straight line or surface as the practice has been hitherto, at the same time making such curved line incline to the other surface of the limb, in order to bring the greatest substance of the iron to and near the bend as is usual; and also in "forming the groove or surface of the rolls of such a shape as will enable me to roll iron tapered on the sides instead of top and bottom, as heretofore."

[Printed, 5d. Drawings.]

A.D. 1856, January 11.—N° 84.

**CLARKSON, THOMAS CHARLES.**—Improvements in pumps, plank, &c. The materials used in forming pumps, &c., are alternate “ layers of thin wood, canvas, or prepared leather, and sheet cork, “ adhered by adhesive substances, such as india-rubber, &c.” The cork material is always applied in the part of the pump where the bucket or plunger works, to avoid undue friction. The pump may be square, oblong, or triangular, “ and so formed as “ to act as a force or ordinary pump in case it is required. “ I “ curve the bottom part of my pump to fit the section of a ship “ or other vessels; I also provide them with a slide to open on “ one side, to enable the chamber to be cleared out in case of “ fouling, and also to be readily repaired. The bucket or plunger “ is composed of” two “ thin square plates of iron or other metal, “ or wood, with the cork & leather material placed between, laid “ horizontal, so that the edge of the material works free on the “ chamber;” and in case of wear it can be moved to make up the part worn, not requiring new leather, “ ‘as ordinary cupped or “ ‘other leathers.’ I also have a lip or flap made of cork “ material, fixed on the top of the bucket or plunger, to prevent “ dirt coming in contact with the face of the leather & cork “ material working on the chamber, the action of which also “ gives a more perfect” vacuum.

In the formation of compass timbers, or planking for ships, and for other building purposes, “the alternate layers before “ named are used according to the object to be made and the “ strength required. The timbers or planking are formed hollow “ or solid, or in case of need, iron, in tube, rod, or sheets, is “ worked therein.”

[Printed, 10d. Drawings.]

A.D. 1856, January 12.—N° 91.

**OUDRY, CHARLES FRANÇOIS LEOPOLD.**—The invention consists “ in preserving wood, metals, paper, cardboard, stone, and “ substances of like nature, from the injurious action of water, “ the atmosphere, or other destructive agents, by first covering “ them with a coat of paint composed of metallic or other mat- “ ters, combined with essential and fat oils, or with resinous,

“ gummy, bituminous substances, according to the nature of the  
“ material; which coat, when dry, is afterwards covered with a  
“ coating of copper or any other metal or alloy, by means of  
“ electric or galvanic agency.” “ This invention is suitable for  
“ covering the hulls of vessels with copper or other metallic  
sheathing prepared by the above process.”

[Printed, 3d. No drawings.]

A.D. 1856, January 16.—N° 113.

LAW, HENRY.—“ Improvements in heaving up slips for the  
“ repair or construction of ships or other vessels, and for a  
“ continuous action purchase for the same, which is also applicable  
“ to other purposes.” The cradle or carriage for the reception  
of the vessel is to be constructed with a longitudinal hollow or  
depression, adapted to receive the keel and a portion of the vessel,  
so as to allow the line of the bottom of the keel to be wholly or  
partly below the line of the surface of the rails upon which the  
carriage or cradle runs, the railway being also formed with a  
hollow or depression between the centre lines of rails, correspond-  
ing with that of the carriage or cradle, by which means, without  
lowering the level of the line of rails, vessels may be hove up,  
drawing a larger depth of water than those drawn up upon the  
present system; the necessity of carrying the rails to so great a  
distance under water is by this means avoided, and the vessel may  
be received upon the cradle in the condition and trim in which  
she may chance to float without any previous adjustment of her  
cargo or ballast. The invention also consists of a continuous  
action purchase for drawing the vessel's up the slip, and which is  
applicable to other purposes.

[Printed, 1s. 4d. Drawings.]

A.D. 1856, January 16.—N° 118.

THOMPSON, JOHNSON.—The object of these improvements is  
to get greater strength in constructing the keelsons of ships, par-  
ticularly of timber built ships. For this purpose the keelson  
of a ship is composed of plates of sheet iron on edge, or of angle  
iron in combination with pieces of timber, the iron and the tim-  
ber being fastened together horizontally by bolts, and the keelson

bolted to the keel as heretofore, the bolts or fastenings which fix the keelson to the keel passing by preference through the timber, of which the keelson is partly made.

[Printed, 9d. Drawings.]

A.D. 1856, January 22.—N° 171.

FRANCIS, JOSEPH.—“The object of this invention is to manufacture metallic boats with greater facility and economy than heretofore.” In a former Patent, No. 10,689, it was proposed to employ a half round corrugation, to give rigidity to the sheets of metal which formed the sides of the boat, and also to take up the surplus metal at the parts of the sheet where a contracted surface was required to conform to the curved lines at the head and stern; but this shape of corrugation, running in one unbroken line from head to stern, although imparting great strength to the boat, rendered its manufacture too costly for practical purposes, inasmuch as for every sized boat a separate set of dies was required. To remedy this defect, I have so modified the form of the corrugation as to admit of a sheet of corrugated metal being bent to any required sectional figure, to suit boats of different breadths and models without deducting materially from the resisting strength of the corrugations, and to provide for varying the length and breadth of boats; I form the sides thereof of sheets of metal, set breadthwise along the keel, and jointed together by lap joints running parallel or nearly parallel with each other from the gunwale to the keel.”

[Printed, 10d. Drawings.]

A.D. 1856, January 26.—N° 213.

DORAN, PATRICK.—“Improvements in pneumatic apparatus for raising sunken vessels or other bodies under water, and for keeping afloat vessels or other bodies liable to sink.” The invention consists in “constructing and applying peculiar flexible air and waterproof bags, which are readily placed inside the ship or vessel to be raised, or attached to a chain first made fast around the sunken ship or vessels.” “Over these bags” is affixed strengthening network, and strong bands are applied around them at short distances from each other, to which are

" attached hooks or other instruments to connect the bags to the  
 " chain or chains, or other parts of the vessel. A flexible pipe is  
 " attached to each bag, through which air is pumped from above  
 " into it, and there is also a valve opening into the bag at the  
 " entrance of each air supply pipe, by which any return of air is  
 " prevented."

[Printed, &c. No drawings.]

A.D. 1856, January 30.—N<sup>o</sup> 249.

**TOWARD, JOHN.**—(*Provisional protection only.*)—This invention consists in a mode of strengthening the plates used in the hulls of iron ships, at the part where the bulkheads join, or of strengthening the bulkheads themselves, by rolling a longitudinal or transverse rib on the plates. When rolled longitudinally, it is proposed to cut pieces out or step the sides of the plates so ribbed, so that the joints with the other plates may be crossed. When the rib is rolled transversely on the plate, it is formed or rolled near one end, the plates being reversed alternately, so as to cross the joints, and form a continuous rib across the vessel, to which rib the plates forming the bulkhead may be rivetted. Plates so constructed are also applicable to the construction of boilers or tanks requiring stays, and also in many instances where T-iron is now used, or where there is not room to rivet T-iron on.

[Printed, &c. No drawings.]

A.D. 1856, February 1.—N<sup>o</sup> 279.

**LAMB, ANDREW, and RONALDS, JOHN.**—This invention  
 " consists in uniting or joining the plates, which form the skin of  
 " the ship or vessel, by strips, commonly called butt strips, placed  
 " outside of the skin, whereby we dispense with the liners or filling  
 " pieces, which are ordinarily used for filling up the spaces between  
 " the frames and the skin of the vessel, and whereby we bring the  
 " whole of the skin or plating of the ship or vessel in immediate  
 " contact with the frames thereof." These strips or straps may  
 either be confined to the breadth sufficient to take the rivets on  
 each side of the joint, or they may be worked as a complete outer  
 skin, thus forming a flush bottom within and without.

[Printed to Sec. Drawings.]

A.D. 1856, February 4.—N° 296.

PAULING, RICHARD CLARKE.—(*Provisional protection only.*)—An invention for “expelling water from vessels, and keeping them “from sinking, raising sunken vessels, keeping water out of coffer “dams, caissons, foundations, or vessels, or works that are below “water, and propelling vessels on and through water.” The mode to be adopted for expelling water in these cases, is to make the upper part of the vessel airtight, by fastening down hatches and by other means, and then to force air into the vessel by force pumps. It is proposed to propel vessels by “discharging compressed air therefrom, under the surface and against the water.”

[Printed, 8d. No drawings.]

A.D. 1856, February 9.—N° 345.

DUNCAN, JOHN WALLACE.—“Improvements in or connected “with apparatus for the generation and application of steam for “impelling purposes.” The fifth part of this invention consists in fitting a screw propeller of a peculiar shape at each end of the ship. These propellers do not work in a vertical plane in the ordinary way, but in planes the upper parts of which are inclined aft, so that “the act of propulsion at the bow of the vessel will tend to “displace the water immediately in the course of the vessel, and “cause her to make easier way through it; besides which, throwing “the water in a downward direction has the effect of offering a more “solid resistance to the action of the propeller.” The inclination of the stern propeller “will enable the propeller to obtain a more “dense hold of the water, and will assist in keeping her stern up, “and so tend to reduce her draught of water at the keel.” The propellers are so jointed to the shafts, as to be capable of having alterations made in the angles which they form with them, both vertically and horizontally. By so moving the propeller while in motion as to incline it on either side to its shaft, an impulse will be given to the shaft to cause the vessel to turn round in the manner of steering without the assistance of a rudder, and the power of altering the vertical incline, enables the best incline to be established for the purposes of propulsion. The sixth part of the invention relates to the application of motive power for the purpose of impelling a raft or vessel through the water, and also at the same

time rendering it capable of travelling over land or ice. This consists in mounting or floating the raft upon and a little above watertight cylinders, the axes of which are in the direction of the length of the raft, and which are surrounded by screw threads. When motion is given to these cylinders about their axes by an engine mounted upon the raft, they will by the resistance of the screw blades against the water, or by the hold of their edges upon ice or land, cause the raft to advance.

[Printed, 3s. Drawings.]

A.D. 1856, February 25.—Nº 480.

CLAUS, CHARLES FREDERICK. — "Improvements in metal shipbuilding, applicable also to steam boilers, bridges, and other structures in which metal plates are used." The "invention consists in the production of extended surfaces of metal by uniting a number of bars or strips in such manner that they are interlaced or platted together. In order to obtain greater firmness, I notch the said bars or strips, and so arrange them that projecting parts fit into corresponding recesses; and I round the lapping edges in order to gain a smooth face. I also weld the several portions, or apply tin and lead," or other metals, so as to solder the whole together.

[Printed, 5s. Drawings.]

A.D. 1856, February 29.—Nº 517.

LOGAN, JAMES.—(*Provisional protection only.*)—The invention consists of improvements in that part of a pump known as the suction pipe, or the pipe leading from the pump to the hold or bottom of the ship." To prevent the pumps from choking, "I place an oblong chamber in any convenient position between the pump and the end of the pipe, in which chamber the rose or perforated plate is placed, this serves as a receiver for all dirt which may be drawn from the bottom of the ship, and having a cover readily taken off is easy of access, and may be emptied at any time; and to facilitate this, I use a rod passing through a stuffing box on the top of the chamber, having a piston or hammer at the extreme end, and by moving the rod up and down, any substance which may have choked the pipe will

“ be forced out at the bottom, or lifted into the chamber and cleared away ; by this arrangement, the pipes can always be cleansed, even when under water.”

[Printed 3*d*. No drawings.]

A.D. 1856, March 15.—N<sup>o</sup> 625.

WRIGHT, EDWIN THOMAS.—This invention consists in so arranging and joining the plates of which iron ships and boats, boilers, and other articles are made, “ that the line of rivetted joints shall run in a direction oblique to the axis of the boiler or other vessel, and oblique to the direction of the greatest strain.”

[Printed, 6*d*. Drawings.]

A.D. 1856, March 18.—N<sup>o</sup> 643.

ROWLEY, EDWARD, and HADLEY, JOHN.—“ A new or improved method of shaping iron.” The invention consists in the method of giving a taper form, or a form more or less approximating to a taper form, to bar iron, whether the said bar iron be plain or angle iron, or T iron, or iron otherwise shaped, by means of pressure applied to the iron, by which pressure the iron is forced to assume the shape of the die or mould in which it is placed.

[Printed, 6*d*. Drawings.]

A.D. 1856, March 26.—N<sup>o</sup> 725.

ROCK, JAMES, junior.—“ Improvement in carriages, parts of which are applicable to other structures.” It is proposed to construct waggons, ships, huts, and other structures, or parts thereof, of a number of plain, painted, or varnished solid panels, covered with leather or other material, or not, and hinged or jointed together so as to fold or collapse ; or of panels with flexible parts, serving in lieu or aid of hinges ; or of panels consisting of a number of pieces or strips jointed together, or connected after the manner of a Venetian blind ; or of panels consisting of pieces of wood jointed together edgewise by screwed or keyed bolts, which may be tightened to obviate the shrinking of the wood.

[Printed, 1*s*. 3*d*. Drawings.]

A.D. 1856, March 26.—N<sup>o</sup> 726.

NEWTON, WILLIAM EDWARD,—(*a communication.*)—This invention has reference to a novel construction of boat for submarine navigation, and to improved appliances for supplying air to divers, and also to improved means for raising sunken articles. The submarine boat is made strong enough to resist the pressure of the water at the depth it is intended to go, and to this end it is constructed of iron with stout ribs to prevent collapse. It is preferred to give it an egg shape with pointed ends. It is propelled by a screw driven either by manual power, or by a clock spring, or electro-magnetic machine. To this boat an ordinary rudder is fitted at the stern, and "an up-and-down rudder" at the bow. It has two keels, so that it will sit level upon them. Ingress is obtained at a man-hole at the top. The boat, which forms an air reservoir, should be made large in order to contain air sufficient for several men to breathe as long as they may require to be under water without opportunity to ventilate it. When the air requires renewal, a little water is pumped out, and the boat rises to the surface. Pipes are then thrust up about six feet above the water, their valves are opened, and the air at the top part of the interior being pumped out, its place is supplied by that which naturally flows in. To recover submerged property when found in deep water, such as a ship, gas bags are used, each of which is calculated to float to the surface a weight equal to about ten tons. Such a bag would be of a cylindrical form, about twelve feet six inches long, and six feet in diameter when inflated. The bag must be made air-tight, and strong enough to contain the gas. It has a valve, held closed by a spring and by the outside pressure, which will allow the gas to escape whenever the pressure within is greater than is deemed safe. The bags are attached to the sunken vessel by chains, and then inflated.

(Printed, 10d. Drawings.)

A.D. 1856, April 3.—N<sup>o</sup> 808.

WHITE, THOMAS, junior.—"Improvements in slips and ways" for receiving ships or vessels requiring repair, and for apparatus "to be used for hauling up ships or vessels." The invention relates, firstly, to an improved mode of constructing the longitudinal inclined way, up which the ship or vessel is to be drawn.

In ordinary slips the way is provided from end to end with rails, which extend down in one uniform incline, to such a depth below water, as will admit of the cradle or carriage on which the vessel is to be supported, being carried down under the said vessel. Instead of carrying the rails down in this way to the bottom of the slip at the same incline, "I propose to carry them down only  
" to a point a little below the head of the vessel to be operated  
" upon; for instance, supposing the slip is intended for a vessel  
" not exceeding a given tonnage, and having a draught not ex-  
" ceeding, say, twelve feet, I carry the incline down to that point,  
" and then curve the way beyond or below that point, so as to  
" bring the end of the rails to a horizontal or nearly horizontal  
" position." By this means, without diminishing in the least the efficiency or capacity of the slip, it is frequently possible to build slips without the use of coffer dams, by reason of the diminished depth of cutting required.

Secondly, to the arrangement of the upper part of the slip or way, or that part upon which vessels are intended to be placed while under repair, the object being to increase the capacity of the slip for retaining vessels on their cradles. For this purpose  
" I construct at any convenient part of the upper way a lateral  
" way, on one or both sides of the longitudinal way, and at  
" right angles thereto, and I connect the two ways together in  
" such a manner that when the carriage with the vessel thereon  
" is brought up to the point of junction on the longitudinal way  
" it may be moved laterally off the longitudinal way, so as to  
" admit of other vessels being carried past if required." These ways may in their turn communicate with ways parallel to the main way, and thus afford increased means for stowing away vessels.

Thirdly, "to the apparatus for hauling up ships or vessels, and  
" consists in the employment of a second or runner chain, by  
" which the power of the hauling-up machine or motive power is  
" doubled without occasioning any additional stress upon such  
" machine." "This second or additional runner is worked by a claw,  
" which makes the traction rods that connect it with the runner a  
" continuous chain, and renders it unnecessary to stop the engine  
" when the rods leading from the cradle to the chain are to be  
" shifted."

A.D. 1856, April 5.—N° 835.

**BETTELEY, JOSEPH.**—(*Provisional protection only.*)—"Improvements in the manufacture of iron for knees for ships or other purposes." "This invention consists in making double-tapered bars of iron by means of rollers of equal or unequal sizes, the forms of the double-tapered bar being cut thereon. To obtain this double-tapered bar, I pass iron between the widest part of the rollers, causing them to revolve one and a half or more times, producing thereby a succession of inclined planes in one bar, which, being cut or sawed through at the thinnest part, form double-tapered shapes of iron, from which knees, suitable for ships or other purposes, can be made by bending the bar at the thickest part."

[Printed, 3d. No drawings.]

A.D. 1856, April 9.—N° 857.

**LAXTON, HENRY**—(*a communication from Alexander Le Mol. Provisional protection only.*)—"A new and improved apparatus for increasing the buoyancy of ships and other vessels." The invention consists in attaching a series of floats to the side of a ship or vessel, so that they may be capable of being drawn through metal tubes or guides. These tubes are fixed or built into the sides or ends of a ship or other vessel, and windlasses and other apparatus are used for drawing the floats backward and forward by chains or ropes, so as to cause the floats to be fixed or placed at such part of the ship or vessel as may be required, in order to raise it. The floats are of two shapes, viz, elongated and cylindrical, or spheroidal. The longitudinal floats are in three pairs of equal length. The spheroidal floats are four in number, two for the bow and two for the stern of the vessel. They are constructed of any material uniting the conditions of strength, pliability, and impermeability to water. "Parallel with the vessel's line of flotation when fully loaded, and at a distance under this line of about half the diameter of the widest longitudinal float, a line is marked on both sides of the hull, and two other lines, parallel to the same, and between it and the keel, so as to be about equidistant from each other and from the keel. Then three lines, extending near the bow to near the stern on both sides of the vessel,

“ are traced for the reception of three pairs of tubular rails, by  
“ means of which the longitudinal floats are applied to perform  
“ their office. Two other pairs of similar rails, descending at the  
“ bow and stern to the keel of the vessel, are provided for the  
“ reception of the four spheroidal floats. All these rails of  
“ tubular form are of a diameter admitting the easy passage of the  
“ float ropes or chains, and are made with an external slit, with  
“ lips turned over on each side, continued the whole length of the  
“ tube,” wide enough to permit the passage of the hose attached  
to each float, by which it is inflated, “ but too narrow to allow the  
“ chains or ropes to be pulled or torn through them, so that the  
float when introduced into the rails can be easily slid along them  
“ forwards or backwards, but cannot be pulled out through the  
“ slits.”

“ The longitudinal rails ascend at both ends by gentle curves, in  
“ a direction nearly perpendicular towards the port holes or other  
“ openings, made for the purpose near the bow and stern; there  
“ they, as well as the upright rails, are slightly curved towards the  
“ deck, so as to present their mouths, which are somewhat widened  
“ and curved, close to or rather in the deck floor, where they open  
“ on the deck.”

[Printed, 4d. No drawings.]

A.D. 1856, April 11.—N<sup>o</sup> 870.

FONTAINEMOREAU, PETER ARMAND LE COMTE DE, —  
(*a communication.*)—This invention relates to improved apparatus,  
firstly, for estimating in a constant manner the speed or steerage  
way of ships or vessels, also for ventilating the holds of the  
same; secondly, for measuring the velocity of currents of air and  
water, and, consequently, the quantities of liquids run off either  
freely, as in a river, or through pipes.

The ventilation of the holds of vessels is performed by the use  
of a double-cone tube, in which a suction or vacuum effect is pro-  
duced by the passage through it of the water in which it is im-  
mersed. A flexible pipe connected at one end with the double-  
cone tube, and at the other with the space to be ventilated, draws  
off the foul air.

[Printed, 10d. Drawings.]

A.D. 1856, April 16.—N° 909.

NEWTON, WILLIAM EDWARD, — (*a communication from Thomas Bell.*)—"Improved apparatus for raising sunken vessels and increasing the buoyancy of floating vessels." The invention consists in an apparatus composed of two water-tight hollow floats or tanks, each being complete in itself, or constructed in two or more sections, one being adapted to fit to the bow and the other to the stern of a vessel; the said floats or tanks being provided with suitable tackle," "to connect them together and confine them to the vessel, and also with suitable adjustable chocks for the purpose of receiving the downward pressure of the vessel, through iron plates or wooden blocks bolted to its sides. The floats or tanks are to be floated near to the vessel, and then sunk or partially sunk by filling them wholly or partly with water, after which they are drawn into close contact with the bow and stern, and secured together and to the vessel, and their chocks are brought into action. The water is afterwards pumped or forced out of them, which causes them to float or rise and buoy up the vessel, and thus enable it to be taken into port." "The general form of both these tanks in their horizontal section resembles the letter V, which enables them to fit respectively against the bow and stern of the vessel, and to lay some distance along the sides thereof. When floating the ship away, the float which is at the bow, or in advance, will move through the water with comparatively little resistance, as it resembles to a certain extent the bow of a ship, and will divide the water like a wedge. The top and bottom of the floats are flat, and the inner faces which come next the vessel should be made of such curved form as may be considered most suitable, so as to approximate nearly to the form of the vessels for which they are intended."

[Printed, 7d. Drawings.]

A.D. 1856, April 23.—N° 977.

BARBOUR, JAMES.—This invention consists in an improved arrangement of sawing machine. According to one modification of the improved apparatus, a strong vertical frame is erected, furnished with a platform, across which the wood to be sawn is

“ traversed, and which is fitted, if convenient, with the driving  
“ gear of the machine.” This “ vertical frame is open to receive  
“ two pulleys, placed one over the other upon horizontal spindles,  
“ the bearings of which are adjustable in grooves, or in any other  
“ convenient manner, upon the sides of the frame. The peri-  
“ pheries of the pulleys are of a width proportioned to the saw  
“ blade to be used, and this saw blade is made in the form of an  
“ endless belt, which is passed round the two pulleys. The saw  
“ belt is kept properly stretched by means of a screw or other  
“ adjustment, by which the bearings of the two pulleys can be  
“ separated more or less. Either one or both pulleys may be driven  
“ in any convenient way by means of gearing connecting them  
“ with any prime mover.” Arrangements may be adopted for  
shifting the wood to be sawn, laterally or otherwise whilst being fed  
up to the saw blade, so as to cause the wood to be curved when  
sawn, as for example, screws acting vertically and horizontally  
upon a frame or table carrying the wood to be sawn, and actuated  
by workmen watching the action of the saw; or, if it is required  
to cut out circular forms, the wood may be carried upon a table  
or in a frame, which is made to turn about an adjustable centre, set  
on the platform at such a distance from the saw as to give the  
desired radius of curvature.

[Printed, 7d. Drawings.]

A.D. 1856, May 2.—N<sup>o</sup> 1042.

NAYLOR, WILLIAM.—The invention relates to improvements in  
power or steam hammers, and in rivetting machines, and to the  
manufacture of bolts and rivets by the improved power hammers,  
and consists in the use of a piston rod for power hammers, fitted  
on to each side or end of the piston, the upper or back end of  
such piston rod working in a closed blank pipe, but not through  
into the atmosphere. “ When used as a rivetting machine, I ”  
usually “ employ one double acting power hammer working either  
“ direct or through a lever to drive the pin to be rivetted into its  
“ place, and afterwards to hold on the end of the pin by the  
“ steam or air acting on the piston, while a second double-acting  
“ power hammer working direct or through a lever completes  
“ the rivetting. I also make use of an eccentric or screw or  
“ some other mechanical power to hold the plates to be rivetted  
“ against the post or stem during the process of rivetting. These

“ rivetting machines may be used either as fixed or portable  
 “ machines, and may be hung in ropes, chains, or slings, to the  
 “ object to be worked upon, such as ships, boilers, tanks, or  
 “ bridges. The motive power is to be conveyed from its source  
 “ by suitable metallic or flexible pipes to the machines.” “ In  
 “ making rivets, I use a circular block, revolving on a shaft  
 “ vertically. The die to receive the pin to be formed into a bolt  
 “ or rivet consists of perforations made in the circular block from  
 “ the outside towards the centre, and of such length and diameter  
 “ as the rivet or bolt is required to be when finished. On one  
 “ side of the circular block are holes, corresponding in number  
 “ with the die holes for the rivets, and a pin, actuated by a spring  
 “ or weighted lever, is inserted into one of the side holes to hold  
 “ the block steady while the rivet is being formed by the hammer.  
 “ A communication is made between the” “ bottom of each die hole  
 “ and the bottom of the corresponding side hole, and a jet of  
 “ water may play into the side holes to keep them cool, and also  
 “ to contract the heated rivet, that it may fall out during  
 “ the hammering of the others, as the rotation of the block  
 “ proceeds.”

[Printed, 1s. 4d. Drawings.]

A.D. 1856, May 2.—N° 1047.

BROOMAN, RICHARD ARCHIBALD.—(*a communication.—Provisional protection only.*)—“ This invention consists of improve-  
 “ ments in machinery for bending or shaping timber, especially  
 “ adapted for the formation of curved timber for ship-building.  
 “ In the construction of timber bending machines, heretofore,  
 “ the clamping trough which holds the beam is moved from one  
 “ end only, the opposite half or end remaining stationary, which  
 “ increases the resistance and power required to work the machine;  
 “ and one of the unimprovements in the present invention consists  
 “ in such an arrangement that both ends of the trough are moved  
 “ simultaneously, whereby the power required to operate may not  
 “ only be reduced, but the work is also superior.

“ A second unimprovement is in a means for preventing the  
 “ breaking of the fibres on the outside of the wood at the angle  
 “ or bend. This is accomplished by dividing the draw chain and  
 “ fixing it at the middle to a strong moveable block, which may  
 “ be set up by a strong screw, so as to press upon the wood at

“ the weak point, and thus support the fibres. In connection  
“ with this, means are also provided to keep up the pressure at  
“ this point after the timber is removed from the bending trough,  
“ and until it has become fully set and dry.”

[Printed, 6*d*. Drawings.]

A.D. 1856, May 3.—N<sup>o</sup> 1053.

CUNNINGHAM, HENRY DUNCAN PRESTON.—(*Provisional protection only.*)—The invention consists in increasing the safety and buoyancy of ordinary boats “by adapting thereto certain  
“ buoyant agents, which will at the same time convert an ordinary boat into a life boat, and serve as fenders to prevent  
“ damage to the boat in going alongside of ships or vessels, quays, or other bodies. I prepare a piece of canvas, or other  
“ strong material of suitable length, with an edging of rope, and  
“ suitable holes worked in the canvas to receive ropes. Upon this  
“ canvas, or other material, I affix tubes or cylinders of cork,  
“ covered with canvas, hollow tubes, or other suitable buoyant  
“ agents, so fixed to the canvas as to allow it to be flexible, or  
“ capable of conforming itself to the shape of the sides and  
“ bottom of the boat. I propose that these pieces of canvas  
“ shall be in pairs, that is, one or more for each side of the boat.  
“ I connect the pieces of canvas together underneath the boat by  
“ means of rope or chain passed through the holes in the canvas,  
“ and I secure the canvas to the boat’s side at the upper part by  
“ suitable rope lanyards, &c. I intend also to apply my buoyant  
“ apparatus or modifications thereof at the bow and stern of  
“ boats.”

[Printed, 3*d*. No drawings.]

A.D. 1856, May 22.—N<sup>o</sup> 1218.

HUBERT, ALEXANDRE.—“An improved apparatus for ventilating ships or vessels.” This apparatus consists of a ventilating fan, composed of four or more arms or wings, and placed in a cylindrical box or case. It is made to rotate with considerable rapidity by means of gearing. The rapid rotatory motion causes the impure air in the vessel to enter through an opening on each side of the cylindrical case, when it becomes forcibly expelled through the discharge pipe, and

passes out to the external air through a bent pipe at the upper end. The apparatus can be put in motion by steam, wind, or other motive power.

[Printed, 8d. Drawings.]

A.D. 1856, May 22.—N<sup>o</sup> 1223.

**CUTLER, JOB.**—"Improvements in the manufacture of metallic pipes or tubes to be used for various purposes." The improvements consist, first, in manufacturing metallic tubes parallel or cylindrical at their inner surface, and conical or taper at their outer surface, by passing the same over a mandril by a series of rolls.

Secondly, in manufacturing tubes "parallel or cylindrical at their outer surface and conical or taper on their internal surface, by passing pipes or tubes taper or conical outside through grooved rolls or dies, so as to cause the tubes by the action of external circumferential pressure without internal pressure to become conical or taper on the inside and parallel or circular on the outside."

Thirdly, in expanding, bell-mouthing, and flanging pipes or tubes "used as stays for ship decks and other such like purposes."

[Printed, 1s. 7d. Drawings.]

A.D. 1856, May 23.—N<sup>o</sup> 1238.

**GALLOWAY, GEORGE BELL.**—(*Provisional protection only.*)—"Improvements in the furnaces of marine boilers, and in the construction of steam vessels."

The improvements in the construction of steam vessels consist in forming them "with a series of hollow pipes or channels at the upper part, between the bulwark and the bend of the vessel, of such form as may be" adapted "to the form of the vessel, both in the horizontal and cross sections, such pipes or channels being larger in the cross section near the bulwark, and smaller as the vessel becomes fuller, that is to say, in proportion to the build of the vessel. These pipes or channels form a kind of buoyant sheathing for the vessel. Cork may be inserted in these tubes. I also insert tubes between the timbers and underneath the beams and decks of the vessel."

[Printed, 2d. No drawings.]

A.D. 1856, May 24.—N° 1243.

**BARRON, PIERSE EUSTACE LAURENCE,**—(*a communication.*)

—“ An improved process for coating metal for ship-building and  
“ other purposes, and in the means of attaching sheathing plates  
“ to ships or vessels.”

This improved process “consists in coating iron or other metal  
“ with another metal or alloy of metals by means of friction, or  
“ causing the metal to be coated to be rubbed with the metal or  
“ alloy of metals that is to form the coating. In order to effect  
“ this object, I securely hold the sheet or article to be coated, and  
“ by hand labor, or by means of a mechanical arrangement  
“ similar to that used in planing machinery for traversing the  
“ cutting tool, I force a lump or piece of metal, or a suitable  
“ alloy, of any convenient size and shape, over the surface of the  
“ iron or other metal to be coated, and by means of the friction  
“ created between the two metals during the passage of the soft  
“ metal or alloy of metals over the iron or other metal, the  
“ former will be partially fused and abraded, and will leave a  
“ coating thereof on the iron or other metal to be coated. This  
“ operation will be facilitated by the application of artificial heat  
“ to the soft metal or alloy of metals.”

“ In order to sheathe iron ships, I secure to the sides of the ship  
“ or vessel, beginning at about the water run, metal strips or pieces,  
“ between which and the sides of the ship sheets of my improved  
“ or other coated metal, or other suitable sheathing metal, are  
“ inserted, and afterwards secured therein in any convenient  
“ manner. By this means the attaching the sheathing metal to  
“ the sides of the ship by means of nails or other analogous  
“ metal fastenings is dispensed with, and therefore iron ships may  
“ be sheathed with the same facility as wooden ones.”

[Printed, 1s. 4d. Drawings.]

A.D. 1856, June 13.—N° 1402.

**MASON, WILLIAM.**—(*Provisional protection only.*)—“ An im-  
“ proved rowlock for boats.” The rowlock is formed of metal,  
and consists of a frame which embraces the two sides and covers  
the top of the gunwale of boats, and which carries at top two  
rests, forming a crutch for the oar to work in. To secure the

rowlock in its place, mortice-holes are made in both sides of the frame and in the gunwale, through which bolts are passed and secured by hooks or pins. It is found advisable to place a plate of metal on the inside and outside of the gunwale, at the parts where the rowlocks are to be fitted, to obviate any inconvenience which might arise from the wood swelling.

[Printed, 3d. No drawings.]

A.D. 1856, June 13.—N° 1406.

**FONTAINEMOREAU, PETER ARMAND LE COMTE DE,**—(*in communication.*)—"This invention consists, firstly, in a peculiar mode of constructing keels of vessels: secondly, in constructing and strengthening the hulls of vessels by means of iron brace pieces, and by an unproved method of uniting and fitting the ribs together, so that the hull shall be strengthened throughout." The keels or "keelson keels" are composed of three iron plates, each made up of several convenient lengths, and equal in depth to the aggregate depth of the ordinary keel, floors or ribs, and keelson. The middle one, which may be called the keel, has forks which extend upwards in the spaces between the frames, and the others, which may be called keelsons, have similar forks which extend downwards in these spaces. When these are placed side by side and are riveted together, they clasp all the ribs firmly together. For ships which do not require this amount of strengthening, "the ordinary kind of wooden keel and keelson are slotted, so as to admit a portion of the rib-work, wood fillings being placed between the keel and the keelson. The whole is then bound together by strong iron plates cut to the width of the room and space, and which commence at the upper part of the keelson, pass through the room and space, and leave off at the lower part of the keel, being nailed on to the keelson, the fillings, and the keel. The mode of effecting the continuous union of the different ribs composing the shell of the ship is as follows."—The ribs are at first constructed according to the ordinary method, and at the part where they rest upon the keel they may have a groove, varying in depth according to the height of the keel required. "The floor timbers and lengthened knees" "have their scarfs connected by iron knee pieces" nailed and bolted to the ribs. The other scarfs are also connected by iron plates. Fillings are to be put in the openings opposite these plates to receive the frame

and chain bolts. When the hull of the ship is built, "I place in each room and space, between the filling and the keelson keel," wedges which press against the filling and the keelson keel. The object of employing these wedges is to fill the room and space in that part of the vessel, and to secure the keelson keel.

[Printed, 10d. Drawings.]

A.D. 1856, June 21.—N° 1461.

DAVIES, GEORGE,—(*a communication from Reuben Shaler.*)—This invention is designed for the purpose of ascertaining and indicating the amount of leakage or depth of water in the hold of a vessel. It "consists in giving motion to an index for showing the depth of water in the hold by means of the compression of air within a tube by the leakage water. The lower end of the said tube is immersed in the water, and reaches down to nearly the bottom of the hold, and its upper end extends to a convenient height in the cabin or other suitable part of the vessel. At the upper end of the tube a chamber is formed, the upper part of which is furnished with an air-tight elastic cover formed of india-rubber or other suitable elastic material, and composed of a series of annular or diaphragm-shaped plates, joined together alternately at their outer and inner circumferences, so as to constitute an elastic spring of a circular bellows form, the upper plate being made whole for the purpose of preventing the escape of air through it." "To the upper section of the spring a standard is connected, the upper part of which is formed as a toothed rack, and gears with a small toothed pinion, the spindle of which carries an index or pointer; this index moves over the surface of a dial attached to a case fixed over the upper end of the tube; the dial is divided into feet and inches, corresponding with the depth of the vessel, the position of the divisions being ascertained by experiment."

[Printed, 6d. Drawings.]

A.D. 1856, June 24.—N° 1488.

NEWTON, ALFRED VINCENT.—(*Provisional protection only.*)—"The object of this invention is to construct a life-boat that cannot be capsized in any sea, and will permit of being navigated with facility and without danger to the crew. To this end a cylindrical vessel, made of metal or other proper material, and

" of suitable capacity, is provided, and mounted within an open  
 " framing formed of air-tight chambers. This framing takes, in  
 " plan view," a form somewhat like that of a boat; and it is fitted  
 at its " opposite sides with ducks-foot propellers, and at the stern  
 " with a rudder, and a toothed segment for working it. The  
 " central space of this framing or outer boat is open at top and  
 " bottom, and enclosed within it (but not wholly covered by it) is  
 " the cylindrical vessel or inner boat, which is supported on  
 " trunnions set in a line with the axis of the cylinder. The  
 " cylinder is open at its upper side to admit the crew and  
 " passengers, but it may be closed by sliding shutters when  
 " required, suitable provision being made for ventilation. When  
 " a sea strikes the boat the buoyant outer frame may be turned  
 " over on its centres without affecting the position of the central  
 " cylinder. To allow for this change of position a double set of  
 " paddles is provided; and the rudder also is made so as to act in  
 " either position. A reciprocating motion is given to the paddles  
 " from the inner boat or vessel by means of a reciprocating rod,  
 " which passes through the forward trunnion, and is connected  
 " to a pair of rock levers; and the working of the rudder is  
 " effected through a rod which passes through the hind trunnion,  
 " and is fitted at its inner end with a steering wheel, and at its  
 " outer end with a bevil pinion in gear with the segment rack  
 " on the rudder stem."

[Printed, 3d. No drawings.]

A.D. 1856, June 27.—N° 1512.

**FORD, ALFRED.**—(*Complete specification, but no Letters Patent.*)  
 — " Preparing and dissolving in naphtha or oil of turpentine  
 " vulcanized india-rubber, for the purpose of waterproofing, and  
 " for all or any of the other purposes for which the same, not so  
 " prepared and dissolved, is now applicable, and especially for the  
 " coating of iron ships' bottoms." " My process is as follows:—  
 " I first cut the vulcanized india-rubber into small pieces, and  
 " place a quantity of the same in an oval or spherical-shaped  
 " boiler having within it an agitator or stirrer, which is kept in  
 " constant motion during the process of preparation. The only  
 " openings into this boiler are a man-hole with a screw top, a  
 " safety valve which comes into action only when the pressure

“ on the inner surface of the boiler shall exceed twenty-five pounds  
“ to the square inch, and the opening occasioned by the passage  
“ of the stem of the agitator which passes in at the summit. I  
“ then apply heat in such a manner as that three-fourths of the  
“ outer surface of the boiler shall be at once exposed to its in-  
“ fluence, and at a temperature of never more than 300 degrees of  
“ Fahrenheit, and I continue the same until the india-rubber  
“ shall be reduced to the consistence of dough, when I take it out,  
“ and having mixed with it a sufficient portion of French chalk  
“ in powder to remove its adhesiveness, pass it a few times  
“ through metal rollers, after which it is capable of being dis-  
“ solved in naphtha or oil of turpentine in the manner of ordinary  
“ rubber.”

[Printed, 3d. No drawings.]

A.D. 1856, July 1.—N<sup>o</sup> 1545.

BOUSFIELD, GEORGE TOMLINSON,—(*a communication.*)—

“ This invention has for its object improvements in propelling  
“ and steering vessels when the force of water is used. For these  
“ purposes a vessel is constructed with waterways from stem to  
“ stern below the line of floatation. Near the head and also near  
“ the stern there are right angle branch waterways. Steam  
“ engines and pumps put the water in motion in the longitudinal  
“ waterways, and, according as the valves are open at the stern or  
“ head, so will the vessel make head or stern way. By opening  
“ the valves to the branch waterways on either side, at the same  
“ time closing those at the head and stern, the vessel may be  
“ propelled sideways, and the vessel may be steered by causing  
“ the water to be forced out at the side waterways, thus ren-  
“ dering a rudder unnecessary.”

[Printed, 2s. 1d. Drawings.]

A.D. 1856, July 8.—N<sup>o</sup> 1601.

YOUTMAN, WILLIAM.—The invention consists “ in the adap-  
“ tation and application of a shield or guard, composed of wood  
“ or metal, with a tongue or valve of vulcanised india-rubber or  
“ other suitable material, to pipes, closet holes, and other outlets  
“ for the passage of liquids and excrements; also in the adap-  
“ tation and application of the same as plugs for boats.” When

used to cover an orifice in the side or bottom of a boat, so as to answer the ordinary purpose of a boat plug, a small rod or bar should be placed across the hole in order to increase the power of resistance to external pressure.

[Printed, 6d. Drawings.]

A.D. 1856, July 18.—N° 1692.

**HIPKINS, GEORGE FREDERICK, and BRITTEN, JOHN.**—“Improvements in applying springs or weights for the purpose of closing doors, or resisting shocks, strains, or pressure.” Among other things, the inventors describe “a marine buffer,” which, by means of a powerful spring of steel or compressed air, acting on the cable within-board, may be used for the purpose of lessening the shocks sustained by ships or other floating vessels, while riding at anchor in rough weather.

[Printed, 1s. Drawings.]

A.D. 1856, July 26.—N° 1779.

**PAULING, RICHARD CLARKE.**—“Improvements in giving increased buoyancy to ships and vessels, in raising sunken vessels, in keeping structures watertight, and in propelling vessels.” The invention consists, firstly, “in expelling water from and keeping it out of ships or vessels floating in water, which either may have sprung leaks or become waterlogged from collisions or other causes.” It is proposed to do this by fastening down the hatches and making the decks and other parts of the vessel or ship airtight above water, and then “by means of air or blast fans, air pumps, or other apparatus placed on or between the decks, through a flexible hose attached to such fans or apparatus, to force air of a greater pressure or density than the water in the hold of such vessel, and by such means expel the water from the interior of such vessel, either through the apertures it came in at, or by making other apertures below the water line (such apertures to be closed, if necessary, either wholly or in part, by means of valves or other apparatus.”

Secondly, in raising vessels or ships that have sunk, by forcing compressed air or steam into them.

Thirdly, in increasing the buoyancy of, or in imparting buoy-

ancy to vessels, by forcing steam into hollow receptacles attached to them.

Fourthly, in “propelling floating vessels, by means of discharging compressed air” or air and steam “therefrom under the surface and against the water.”

[Printed, 1s. 3d. Drawings.]

A.D. 1856, July 30.—N<sup>o</sup> 1799.

SIEVIER, ROBERT WILLIAM.—“Improvements in preserving wood from decay, and also from destruction by insects.” The invention “consists in subjecting timber or wood, when saturated or impregnated with materials or solutions used for preserving such wood or timber, to pressure between rollers, or otherwise, so as to compress the substance thereof and close up the interstitial spaces, by bringing the woody matter into closer contact.” “I first prepare the wood for pressure by causing the pores to become filled with rosin, tar, pitch, bituminous matters, or any other materials or compounds used for preserving wood.” “I sometimes employ solutions of gelatine, in combination with certain solutions of metallic salts, so arranging the process that their mutual decomposition may take place in the pores of the wood, and solid matter be therein deposited and precipitated; or, I may employ any of the well-known chemical salts or compounds, which will, upon contact or mixture, throw down or deposit solid matter. I also use chemical compounds, such as chloride of mercury, sulphate of copper, sulphate or chloride of zinc, arsenious acid, nitrate or acetate of lead, antimony, or any other suitable salt or poisonous drug, to prepare the wood, prior to its treatment with any of the substances mentioned (by preference), when it is required to preserve such woods from the action of insects; or I use these salts or materials, in combination with the others named, whenever I desire to do so. If the wood or timber is intended for situations where the ‘toredo’ ‘navalis,’ or any other destructive insects abound, it must be first impregnated with some of the above, or other poisonous substances; and (by preference) when the wood is dry, it is to be impregnated with the bituminous substances, and then subjected to pressure.”

[Printed, 4d. No drawings.]

No. 19.

A.D. 1856, August 14.—N° 1902.

**BILBE, THOMAS.**—The invention applies "to the construction of  
" frame timbers and beams for ships and other vessels. I bend  
" two angle irons to the proper mould, and place them at a suit-  
" able distance apart, having the edges towards each other. Into  
" the space left between the projecting edges of the angle irons I  
" bend wood, so as to bear against their curved backs, thus form-  
" ing a compound timber" or rib, or a beam, which may be  
repeated at proper intervals, and covered with planking within and  
without. Holes are provided in the curved backs of the angle  
irons and the wooden filling up, to permit the passage of bolts or  
other fastenings for the planking.

[Printed, 3d. Drawings.]

A.D. 1856, August 16.—N° 1919.

**LILLEY, SAMUEL.**—"Improvements in the manufacture of ships'  
" iron work, a part of which improvements is applicable to the  
" manufacture of other articles in iron." The invention consists  
in the manufacture of slides, blocks, and other castings for ships, by  
the use of chilled moulds, that is to say, metal moulds in place of  
the ordinary sand moulds. These castings are to be made either  
of ordinary cast iron, or of that kind of cast iron which may be  
softened or annealed, and which is commonly called malleable  
iron.

[Printed, 3d. No drawings.]

A.D. 1856, August 30.—N° 2018.

**LONG, FRANÇOIS.**—(*Provisional protection only.*)—The "im-  
" provements relate to a form of life-boat that will take up a very  
" small space on board the ship, and by that means admit of  
" having a much greater number of boats." Its sides are com-  
posed of two sheets of iron or steel, which are rivetted or otherwise  
fixed along the keel, and which collapse and come together when  
the boat is collapsed. Sheets or pieces of steel, forming the bow  
and stern, are jointed to the keel and sides. When the boat is  
collapsed these pieces fold on the sides. Stretching frames are  
fitted forming seats or diaphragms. They are pivotted into the

keel, and are turned in the same line as the keel, or nearly so, when collapsed, but placed transversely thereto when the boat is expanded. The stretchers separate and spring out the steel or iron sides according to their shape, and sustain the form of the boat, the bow and stern pieces being at the same time secured in position. The boat may be entirely or partially covered or lined with flexible waterproof material, to render it water-tight.

[Printed, 3d. No drawings.]

A.D. 1856, September 4.—N° 2050.

**BISHTON, WILLIAM.**—(*Provisional protection only.*)—An improvement or improvements in boats used for navigation on canals, and propelled by steam or other motive power, consisting in so constructing the said boats that the paddle wheels shall occupy a position at the sterns of the boats.

[Printed, 3d. No drawings.]

A.D. 1856, September 11.—N° 2129.

**CHAPLIN, ALEXANDER.**—“Improvements in ships or vessels.”

These improvements consist, firstly, “in forming either sailing or steam vessels with a nearly flat under surface or bottom, extending from stem to stern, with the exception of a slight rounding or curving off towards each end. In longitudinal vertical section, this bottom presents an outline which is nearly straight or level along the middle part of the vessel, and is slightly bent or curved up at each end. The sides of the vessel are nearly vertical, and run into or join the bottom with a slight or narrow bend, whilst they are bent or curved in at each end to form the bow and stern. Or, instead of both ends being formed in this way, the bow may be pointed, and the stern of a square, elliptical, or other convenient form.” “In some cases a longitudinal concavity or slight hollow may be formed in the vessel’s bottom to cause the under current to be decided, and to increase the vessel’s stability, which independently of such concavity is comparatively great, the full or nearly full breadth being extended throughout or nearly throughout the entire immersed length of the vessel.”

Secondly, in constructing vessels of this description, or other vessels, “without any fixed keel, stem or stern post, and in steering them by means of two or more plates or blades, arranged

" obliquely either at the stern or bow of the vessel." Each of these plates, which are inclined on opposite sides to a vertical plane supposed to pass through the longitudinal centre line of the vessel, is arranged to work in a vertical casing fitted in the end of the vessel, and opening below into the water; one plate is projected down or lowered into the water so as to protrude from its casing and from the vessel's bottom, when the vessel is to turn in one direction, the other plate being made to act in a similar way when the vessel is to turn in the other direction. " These steering plates may be actuated or adjusted by means of " various contrivances. According to one plan the plates are " each jointed upon a fixed centre at one end, their free ends " being connected to a wheel in such a way that as one plate is " hoisted up, the other is lowered down, the wheel being worked " like an ordinary rudder wheel, whilst the friction of the plates " in their casings is reduced by arranging antifriction pulleys for " them to bear against." The plates are arranged so as to act considerably on each side of the vessel's longitudinal centre line, which gives them much greater control over the motion of the vessel than an ordinary rudder, as they are outside of the disturbed water which generally follows the vessel along the centre of her wake. The steering plates may be arranged either at the stern or at the bow of the vessel, or in both positions; and in the latter case, the two sets of steering plates may be actuated either simultaneously or separately.

In some cases it is intended to fit the vessel with a central cut-water, consisting of a plate similar to these steering plates, and arranged in the same way in a casing at the bow of the vessel, being jointed upon a fixed centre at one end, and fitted with suitable gearing for raising and lowering it as may be required.

A folding gangway or landing stage may also be fitted on the deck.

Thirdly, in novel arrangements of the engines and boilers of steam vessels constructed according to the first portion of the invention.

[Printed &c. No drawings.]

A.D. 1856, September 13.—N° 2151.

BUCHANAN, JOHN.—This invention "relates to an improved " arrangement and construction of ships or vessels, and a new

“ disposition of their propelling apparatus.” According to one modification, the vessel is made with a curved recess or channel in or near the centre of her bottom, the sides and ends of the vessel being the same, or nearly the same, as in ordinary vessels. In this channel or recess is placed the propeller, which may be of any suitable kind. “ It is intended in vessels of “ light draught to exhaust the air from the channel, so that the “ water will fill this channel, although the latter may rise above “ the general level of the water outside.” By another modification, the channel curves gradually upwards from the fore part of the vessel, and descends in a corresponding or nearly corresponding manner towards the stern of the vessel. A screw propeller is fitted in the central part of this channel or trough, in a trunk which is carried up to the deck, to afford facilities for raising the propeller out of the water when required. In another arrangement the channel is made sufficiently wide to admit of a pair of screws being fitted therein, and a partition or diaphragm is fitted between the screws in a longitudinal direction, to divide the channel into two. Or, lastly, the propeller may be a single paddle wheel, fitted in a suitable recess made in the centre of the ship. The channel is carried upwards from forward and aft in a very gradual rise, until it meets the circular recess in which the paddle wheel is fitted. The propelling portion of the paddle wheel projects below the channel, and as the backwater from the wheel passes away through the channel and under the bottom, it lifts the hull, and tends to assist the progress of the vessel through the water.

[Printed, 10d. Drawings.]

A.D. 1856, September 16.—N° 2163.

WALKER, ROBERT, junior.—“ Improvements in ascertaining “ the draught of water and trim of ships or vessels.” “ This “ invention consists in ascertaining the draught of water of a “ ship or vessel, by means of a vacuum guage communicating “ with the exterior water by a pipe passing through the vessel, so “ that the instrument, being acted on by the greater or less column “ of water outside the vessel, will indicate on a suitable scale the “ draught of the vessel. It is preferred that this instrument “ should communicate with the water at some point near the “ middle of the ship, so that it may always shew the average “ draught thereof; and there are indicators in connection with

the instrument, which are acted on by hanging weights, so as to  
 " shew if the vessel is on an even keel, or the amount of deviation  
 " therefrom, also the amount of list the vessel may have on either  
 " side."

[Printed, 8d. Drawings.]

A.D. 1856, September 25.—N<sup>o</sup> 2248.

**PARNELL, HENRY WILLIAM.**—(*Provisional protection only.*)—  
 This invention consists in building ships and boats with two keels  
 placed at some distance from each other, the portion of the ship's  
 bottom between the keels being arched so as to form a tunnel,  
 which will extend the whole length of the vessel. The crown of  
 the arch forming the tunnel may be pierced for one or more  
 paddle-wheels, to be worked by steam, or in some cases by hand.

[Printed, 3d. No drawings.]

A.D. 1856, September 25.—N<sup>o</sup> 2253.

**CALLEY, SAMUEL.**—"Improved composition and compositions  
 " for coating or covering surfaces, particularly the bottoms of  
 " ships and vessels." To form these compositions take ferruginous  
 ochres or oxides of iron, such as ochres from iron ore washings,  
 dried, powdered, and sifted fine, and to this add coal tar. Mix  
 with these a paint vehicle, or volatile spirit, or both, as turpentine  
 and naphtha, or turpentine or naphtha by preference, and form a  
 paste, the consistence of which paste is afterwards further reduced  
 by the addition of more turpentine, &c, so as to give the mass the  
 same degree of fluidity as ordinary oil paints, then pay over the  
 surfaces to be treated with brushes, as in ordinary house painting.  
 The proportions which have been found to answer to form the  
 paste above mentioned are, 7 lbs. weight avoirdupois of turpen-  
 tine or naphtha, to 2 lbs. weight avoirdupois of coal tar, and  
 about 15 lbs. weight avoirdupois of ochre from iron ore washings,  
 or similar ferruginous ochres. It is proposed, when it is neces-  
 sary to use still more effectual means to prevent the adhesion  
 of seaweed, barnacles, and so forth, to employ a chemical  
 mixture of creosote and coal tar, instead of the coal tar alone.  
 Also, in order to render the composition more effective, ammonia

may be introduced. Sulphur, or sulphuric or sulphurous acid, may likewise be added, with the view of enabling the composition to maintain its properties in hot climates.

[Printed, 3d. No drawings.]

A.D. 1856, October 4.—N<sup>o</sup> 2331.

BETTELEY, JOSEPH. — (*Provisional protection only.*)—"This  
" invention consists in making double-tapered bars of iron by  
" means of rollers of equal or unequal sizes, the forms of the  
" double-tapered bar being cut thereon. To obtain this double-  
" tapered bar, I pass iron between the *widest* part of the rollers,  
" causing them to revolve one and a half or more times, producing  
" thereby a succession of inclined planes in one bar, which being  
" cut or sawed through at the *thinnest* part form double-tapered  
" shapes of iron, from which knees suitable for ships or other  
" purposes can be made by bending the bar at the thickest  
" part."

[Printed, 3d. No drawings.]

A.D. 1856, October 8.—N<sup>o</sup> 2359.

WARD, PETER.—"This invention consists in coating the bottoms  
" of ships with an insoluble soap, of lime or other earthy base,  
" with which is mixed oxide of copper, or other metallic oxide or  
" compound, to prevent the adhesion of barnacles."

[Printed, 3d. No drawings.]

A.D. 1856, October 10.—N<sup>o</sup> 2379.

McINNES, JOHN.—"An improved surface mineral coating for  
" protecting iron and other substances, and an improved vehicle  
" or varnish by which it is applied, and which varnish may be used  
" with or without the addition of other substances." "The mineral  
" employed in forming this improved coating for the protection of  
" iron, wood, and other substances," "is emery stone, reduced to an  
" impalpable powder, and mixed with a vehicle or varnish, composed  
" of lac dissolved in spirit of wine, to which is added common  
" resin, castor oil, and liquid ammonia. The powdered emery stone  
" may be applied as a protector by means of other vehicles, but  
" it is preferred to use the varnish described, and which varnish

" may be used alone, or mixed with other substances, such as  
 " ground glass, sand, cement, and so forth."

" When the surface to be coated is not smooth, but it is de-  
 " sirable to make it so, I add sufficient emery powder to make  
 " the composition of the consistency of putty or stiff paste, and  
 " apply it with a trowel or palett knife. This stiff composition I  
 " propose to use to fill up the spaces between the butts or ends of  
 " the plates, where they are jointed in the construction of iron  
 " ships, and for covering the rivet heads to preserve the same"  
 from corrosion. "The spirit contained in the mixture evapo-  
 " rating quickly, leaves the substance of a stony hardness," so  
 that it cannot be acted upon by moisture or steam.

[Printed, 3d. No drawings.]

A.D. 1856, October 21.—N° 2472.

ATKINSON, ROBERT DAVISON.—(*a communication.—Provi-  
 sional protection only.*)—The invention has reference to an im-  
 proved method of preparing and coating metallic surfaces, such as  
 iron and lead, so as to preserve them from oxidation, and enable  
 them to be employed as substitutes for the more expensive metals  
 as at present in use for various purposes, such as coppering ships'  
 bottoms, &c. and consists, " firstly, in depositing copper or brass  
 " upon surfaces of iron previously prepared, by being melted in  
 " conjunction with carbonic acid gas, and either coating or covering  
 " them with a brush or through the medium of galvanic agency ;"  
 and, secondly, in employing sulphate or sulphuret of lead as a  
 coating, to preserve the surfaces of lead from atmospheric and  
 other influences.

[Printed, 3d. No drawings.]

A.D. 1856, October 29.—N° 2541.

HENZELL, THOMAS SMITH.—" Improvements in the construc-  
 " tion of ships or vessels." According to this invention, ships  
 or vessels " are built almost entirely of straight timber; the  
 " bottom of the vessel is flat, but rises slightly upwards at the  
 " stem and stern. There are three keels. The centre or midship  
 " keel is quite straight, and the space between it and the bottom  
 " of the vessel at stem and stern is filled in with dead wood.  
 " The side keels are curved to the desired form of the bow and

“ run of the vessel, being the only curved pieces in the vessel,  
“ excepting the side keelsons,” the deck beams, and the top rail or  
covering board. “The floor timbers run transversely, and the  
“ inner and outer floor planking longitudinally, with a diagonal  
“ ceiling. The side timbers are quite straight and vertical, with  
“ diagonal planking, the inner and outer planking crossing in  
“ opposite directions. The planks are bolted to the side keels  
“ and keelsons, and, running up the whole height of the vessel to  
“ the upper rail, afford an immense increase of strength to the  
“ vessel. The vessel is also furnished with sliding side keels or  
“ floats, which can be hove up and down, so as to give less or  
“ more hold upon the water, as may be desired, without increasing  
“ the immersion of the hull by means of ballast, and also offering  
“ much less resistance than vessels of the ordinary construction.”

[Printed, 7d. Drawings.]

A.D. 1856, October 31.—N<sup>o</sup> 2556.

FERGUSON, CHARLES AUGUSTUS.—(*Letters Patent void for want of final Specification.*)—“ Improvements in preparing timber  
“ for ship building, mast making, and other purposes.” These  
improvements consist “in preparing timber for ship building,  
“ mast making, and other purposes, by charring the inner sur-  
“ faces for the prevention of mildew and rot; for which purpose,  
“ after the timber is cut out, I take a large iron roller, and having  
“ made it hot, I roll it over the surfaces of the timber, which  
“ are to be placed in contact with each other, until they are  
“ sufficiently charred, after which they may be put together and  
“ united in the usual manner. In treating planks for ship  
“ building, two rollers may advantageously be employed, the  
“ lower one being fixed and the upper one moveable for con-  
“ venience of heating; when the upper roller is heated and  
“ placed above the lower one, the planks are passed between  
“ them, the inside of the plank being placed in contact with the  
“ heated roller.”

[Printed, 3d. No drawings.]

A.D. 1856, October 31.—N<sup>o</sup> 2561.

WORSSAM, SAMUEL, and GRIST, JOHN.—(*Provisional protection only.*)—“ Improvements in machinery for cutting and shaping

"wood" In cutting ships' frames and other timbers from curved or irregularly-shaped wood, the inventors employ band saws, and "cause the wood to advance to the saws, and always in the direction of the grain, or as nearly so as may be, by supporting guiding friction rollers, placed above, below, and, if need be, at the sides of the wood." They sometimes employ two or more band saws for this purpose, connected together in such manner as to act as one saw.

[Printed, Ed. No drawings.]

A. D. 1856, November 6.—No 2616.

CATO, PETER, MILLER, JOHN, jun., and AUDLEY, JOHN.—This invention has for its object improvements in the manufacture of ships' knees. For this purpose, "the iron in each case is first prepared by forging it to a tapering form from the part to be bent towards each end, and this is accomplished by a plain-faced hammer or tool, worked by steam or other power. The face of the anvil or the tool on the anvil is formed with angular or proper shaped grooves, according to the form of the intended elbow or bend of the intended knees. The tapering of the other parts of the bar of iron is accomplished by the same hammer acting on the iron when on other parts of the anvil. The iron being thus forged, is next to be bent into form (which is preferred to be done hot). The hammer or tool is formed with a face corresponding with the interior bend or angle to be given to the knee, and the anvil or tool thereon is made hollow, to correspond with the exterior bend or angle intended to be given to the ship's knee. In some cases, in place of producing the whole bend at once, two or more hammers or tools and two or more anvils or tools thereon are used, each made suitable for bending the bar only part of the whole bend. The hammers are to be worked by steam or other power, and are to be caused to act by impact or by pressure."

[Printed, Ed. Drawings.]

A. D. 1856, November 17.—No 2718.

JONES, GEORGE, and JONES, JOSEPH REECE.—*Provisional protection only.*—"An improved life boat." "To construct a boat according to this invention, the keel, stem, and stern-post are

“ formed as in an ordinary boat. Above the keel at a point  
“ above what will be the water-line of the boat, there is a second  
“ keel, extending from the stem to the stern-post. From the sides  
“ of this second or upper keel the bottom of a boat is constructed  
“ (‘ clinker ’ built by preference), after which a number of cells  
“ or water-tight compartments are constructed between the  
“ bottom of the upper keel and bottom and the lower keel, after  
“ which a complete boat is built from the lower keel upwards,  
“ the sides of the upper bottom being brought into combination  
“ with the sides of the boat.” The boat is constructed with considerable sheer, and at the outsides she is provided with cork fenders, and the bow and stern are fitted internally with partitions or bulkheads, so that should the boat be inverted in the water, being sustained by her extreme ends, she will fall over and right herself immediately. “The upper bottom of the boat is provided  
“ with suitable valves opening outwards to allow the water shipped  
“ to escape through the sides and bottom of the boat.”

[Printed, 3d. No drawings.]

A.D. 1856, November 26.—N<sup>o</sup> 2804.

BLACKWOOD, JOHN.—(*Provisional protection refused*).—This invention consists of “a peculiar mode of casing or lining the  
“ interior of ships with caoutchouc, or with a composition of  
“ caoutchouc and other similar material, so as to prevent the ship  
“ from foundering from accidental causes.”

[Printed, 3d. No drawings.]

A.D. 1856, November 28.—N<sup>o</sup> 2813.

GRIFFITHS, ROBERT.—“ Improvements in vessels, and engines  
“ for propelling vessels.” The improvements consist, firstly, in constructing and forming the bows of vessels with a hollow channel on each side below the water line, the parts below the channel swelling out, “so that when under weigh the water will  
“ be driven away horizontally or upwards (instead of downwards),  
“ thereby causing less resistance to the progress of vessels through  
“ the water.”

Secondly, in the application of an apparatus on the bow of a vessel, which will be put in motion by the resistance offered to it from the water, when the ship is under weigh, so that the power

thus obtained is made available as an auxiliary to the prime mover.

Thirdly, in placing an inclined keel or wing on each side of the principal keel, these three keels being in contact at their junction with the bottom of the vessel, and opening outwards below. The object is to stiffen the vessels, and enable them to carry more canvas.

And, fourthly, in a mode of arranging the engine for propelling vessels, on or between the boilers.

[Printed 1s. 4d. Drawings.]

A.D. 1856, December 2.—N° 2859.

**BOWER, ALFRED.**—(*Provisional protection only.*)—"Improve-  
ments in or applicable to the keels of navigable vessels." The  
object of this invention is to give vessels a greater "hold of the  
water," to enable them to go more readily to windward. To  
accomplish this it is proposed to increase the width of the lower  
portion or base of the keel, by attaching to the vertical sides of  
the keel, pieces of angle iron or timber, "so that the lower portion  
of the keel with its additions will in vertical cross section  
present an inverted T or a truncated pyramidal form accord-  
ing to the shape of the side pieces applied."

[Printed, 3d. No drawings.]

A.D. 1856, December 2.—N° 2860.

**THWAITES, JOHN HALL BROCK.**—(*Provisional protection only.*)—"An improved screw bolt or fastening for ship-building  
and other purposes." The improved fastening "combines the  
properties of a nail or bolt and of a screw, being driven into the  
material by percussion, like a nail, and rotating on its axis  
during its advance, like a screw. These screw bolts or fasten-  
ings are formed of one or more threads, the pitch of the threads  
being greater than the diameter of the bolt. The form of the  
threads, as also of the heads and points of the fastenings, may  
be varied to suit the purposes for which they are intended, and  
the fastenings may be made of various materials, as metal,  
wood, ivory, &c., according to the uses to which they are to be  
applied."

[Printed, 3d. No drawings.]

A.D. 1856, December 13.—N° 2967.

WADSWORTH, JAMES.—(*Provisional protection only.*)—" Certain improvements in heating and ventilating apartments, buildings, and ships, and in apparatus applicable to and to be used for such purposes." These improvements in heating, consist in supplying the apartment to be heated, with air which has been passed through a stove or apparatus, constructed as follows :—

" An external air chamber, having its outlet opening into the apartment to be heated, envelopes an inner chamber or tubes, in which the gas or other heat-producing combustible is to be burnt. The temperature of the air passing into the room is raised, during its circulation through this outer air chamber, by contact with the heated surface or surfaces of the inner chamber or tubes. The outlet of the latter conveys the products of combustion away from the apartment, so that they may not vitiate the atmosphere thereof, and air is admitted to support combustion through valves, by which the supply can be regulated at discretion. For ventilating apartments, I place the stove in communication with the vitiated air occupying the upper part of the room on the one hand, and with the external atmosphere on the other hand, by means of pipes, and allow the draught caused by the heat to convey such vitiated air away. If heat and ventilation are required conjointly, I place the inner or combustion chamber only in communication with the upper part of the room, using the air derived therefrom for the purpose of supporting combustion, leaving the external or air chamber to furnish a supply of warm air.

[Printed, 3d. No drawings.]

A.D. 1856, December 19.—N° 3011.

MURDOCH, JOHN.—This improvement in ships' pumps consists particularly in the simplicity of arrangement, whereby the barrels and chambers are cast in one piece; and, instead of having one barrel working with one suction pipe and one discharge pipe, and one receiving chamber and one discharging chamber," there are "two or more barrels working with one suction pipe and one discharge pipe, and one receiving chamber

" and one discharging chamber, and that either as force pump  
" and lift, or lift pump only."

" In working any pump of a single barrel in the back stroke  
" the water is at a stand still in the suction pipe, and also in a  
" great measure in the discharge pipe; by substituting two or  
" more barrels I obtain a continuous flow through the suction and  
" discharge pipes, instead of alternate or intermittent; thus, a  
" pipe that is used for a single chamber of a given size will give  
" double the advantage in a pump of two chambers."

[Printed, &c. Drawings.]

A.D. 1856, December 23.—N° 3042.

ANDERSON, JOHN.—(*Provisional protection only.*)—"Improved  
" means of protecting floating batteries, ships, land batteries,  
" martello towers, or other constructions against shot or shell or  
" other projectiles." This consists "in covering or protecting  
" the exterior or exposed side of such constructions by means of  
" a combination of plates or sheets of iron, or other metal or  
" material, arranged one above or over the other, as as to offer  
" several separate thicknesses of metal to resist the concussion of  
" any projectiles." "I have found by experiment that if, instead  
" of employing very thick and heavy plates of metal to resist shot  
" and shell, the same quantity of metal be distributed differently,  
" that is, in the form of separate sheets of moderate thickness,  
" placed one over the other, a much more effectual resistance will  
" be obtained. I have therefore based my present invention upon  
" this discovery, and the plan I propose to adopt for carrying it  
" into effect consists in employing a series of thin metallic plates,  
" either of iron or amalgamated steel, arranged one over the other,  
" so that they may either lie close to or be separate from each  
" other, either by the plates being hollowed or curved, or by the  
" interposing of any softer substance, such as cork, felt, caoutchouc,  
" or other elastic material, so as to present a surface not solid but  
" hollow or elastic." "I propose also to interpose between the  
" back of the plates and the sides of the ship, battery, or other  
" construction blocks of caoutchouc or other elastic material,  
" which will yield to a certain extent to a sudden blow and then  
" resume its normal state. In addition to the interposition of an  
" elastic material between the plates and the sides of the ship,

“ such an elastic material may also be placed between the several  
“ plates, so as to form an elastic mass of great resisting  
“ power.”

[Printed, 3d. No drawings.]

A.D. 1856, December 23.—N° 3049.

HEATHER, ALFRED.—This invention consists “ in constructing  
“ ferry boats capable of traversing narrow seas, and rough as  
“ well as smooth waters, in such manner, that while the horses,  
“ cattle, carriages, and heavy goods are placed in the bottom of  
“ the boat they shall be protected by a deck or covering, which,  
“ together with the sides, are suited for passengers.”

The bottom of the boat is elliptical, or nearly so, from stem to stern, with rounded sides. At each end of the keel is a case or trough, through which a rudder descends. The central portion of each end of the boat is made to let down, and form a stage for passengers, horses, and cattle to walk on board. When the stages are drawn up they are water-tight, and above the water line. From the stage the passengers mount by steps one or other of the side decks, and thence they can obtain access to the upper deck, or deck which forms the covering for the horses, carriages, and heavy goods. After the horses and cattle leave the stage, they proceed along the boat under the covered deck, and the space they there occupy may be divided longitudinally into a compartment, which, when required, forms an engine room. The boat may be propelled by paddles, screw, or other means of propulsion.

[Printed, 8d. Drawings.]

A.D. 1856, December 29.—N° 3088.

WELLS, JOSEPH HENRY GEORGE.—(*a communication from Hippolyte François Béranguier.*)—“ Improvements in pumps, and  
“ valves used therewith.” The object of the improvements is to keep the pump always ready to work ; and the valves always in the liquid ; and also to prevent any possible obstruction in working the pump. To effect this the body of the pump is fastened to the deck of the vessel, with the suction pipe (also secured to the deck) bent as a syphon. “ The liquid enters the suction pipe by a  
“ large opening at its base and not on the sides, and is formed in  
“ such a manner that a flat body cannot adhere to it and obstruct  
“ the passage of the liquid. All the solid matters, wood, stone,  
“ or otherwise, of a size less than the suction pipe, are absorbed

“ by the ascending current of the water. At the upper part of  
 “ the said syphon is placed a little cock, having for its object to  
 “ introduce air in that part of the syphon or suction pipe open to  
 “ the liquid to be raised as soon as the pumping is done, and by  
 “ the said admission of air the liquid is retained in the other part  
 “ of the syphon and in the body of the pump, and by that means  
 “ all the valves are in the liquid even when the pump is not at  
 “ work, and by closing the said small cock the pump is again  
 “ ready for use.” With these precautions, suet, oil, fine coal  
 powder, tow, gravels, greasy rags, &c., are kept in suspension in  
 the liquid, and cannot accumulate. “ The apertures of the valves  
 “ are formed like a sack without a bottom at both extremities, and  
 “ reposing at their base on metallic chill valves, which are a little  
 “ larger than the lower part of the suction pipe, for the purpose  
 “ of allowing the solid matters to pass through them. The valves  
 “ are fastened on the two sides, and are formed of two rectangles,  
 “ of leather, oil-cloth, caoutchouc, or any other malleable and  
 “ waterproof matter. If at the end of the stroke of the piston  
 “ or bucket, a solid body should be passing through a valve, it  
 “ will, owing to its,” the valve’s, “ ductile property, adhere to the  
 “ said body, and the pump will continue its work, and at the  
 “ next stroke it will be dragged along and discharged without the  
 “ possibility of perceiving its stoppage in one of the valves.”

[Printed, 8d. Drawings.]

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1857.

A.D. 1857, January 1.—N° 4.

**BOURNE, JOHN.**—(*Provisional protection only.*)—“An improved  
 “ steam train for navigating shallow rivers.” “The train is com-  
 “ posed of a steamer and train of barges articulated to one  
 “ another by circular joints, so as to admit of lateral and vertical  
 “ deflection. The different constituent vessels of the train are  
 “ made with their ends either convex or concave; and each  
 “ convex end fits into a corresponding concave end without  
 “ leaving any considerable space between them, so that the train  
 “ is virtually a very long jointed vessel, of which I prefer that  
 “ the steamer should constitute the first compartment. Each

“ convex end has at the central point from which the convexity is  
“ swept a strong pin, from which two rods or stays proceed to the  
“ outer edges of the contiguous concave ends, and these rods  
“ always keep the constituent barges of the train at the right  
“ distance apart, and prevent them either from touching one  
“ another, or from having too great a space between them. The  
“ train may be steered either by rudders at the bow and stern or  
“ by employing two separate engines to work two paddle wheels  
“ not connected with one another, so that one wheel may be  
“ turned ahead and the other astern. But the mode of steering  
“ or guiding the train which I prefer to employ consists in an  
“ arrangement whereby the first and last barges of the train may  
“ be moved into any desired angle with the body of the train by  
“ means of suitable mechanism applied for that purpose, and the  
“ nature of the course which the train will pursue will depend  
“ upon the direction and amount of the deflection given to the  
“ terminal barges. I also, in some cases, employ suitable de-  
“ flecting apparatus between each of the barges of the train, so  
“ as to throw them in a curve or a circle.”

“ In order to assist the train over sand banks or other shallows  
“ in the rivers it navigates, I cause the paddle-wheels to project  
“ somewhat below the bottom of the steamer, so that they will  
“ be the first part to take the ground, and in case the ordinary  
“ power of the engine is insufficient to draw the train over, I  
“ apply multiplying gearing to the paddle wheels, which gearing,  
“ when thrown into action, will turn the paddle wheels round  
“ with a slow motion.”

“ In some cases I apply two screws revolving in opposite direc-  
“ tions in the bow of the steamer. These screws, which are of  
“ large diameter, and only partially covered by the water, project  
“ somewhat below the bottom of the steamer, and they sweep away  
“ to each side the sand or other impediment which may be in the  
“ steamer's track, and clear a course for her, so that she will run  
“ in the channel which she has just cut. In some cases I also  
“ apply in the bottom of the vessel horizontal revolving arms or  
“ blades like a centrifugal fan, and this instrument, which is  
“ larger in diameter than the breadth of the vessel, sucks in the  
“ sand and water at its central part, and discharges them at its  
“ circumferential part through an opening or openings pointing  
“ astern, thus clearing away the sand from beneath the bottom,  
“ and at the same time propelling the vessel. The train may thus

“ be impelled either by paddle wheels at the sides, by screws  
“ turning in opposite directions in the bow, or by an instrument  
“ resembling a revolving fan or centrifugal pump in the bottom,  
“ and the whole or any portion of these methods may be employed  
“ simultaneously for propulsion or for aiding the progress of the  
“ train over the shallows.

“ The whole of the vessels or barges constituting the train I  
“ prefer to build of iron, and when so built I truss the steamer  
“ by means of iron pipes rising up above the deck, from the bow  
“ to the vicinity of the paddle boxes, and descending from thence  
“ to the stern. I also place on each side of the steamer near the  
“ stern a rudder, which usually lies inoperative against the ship's  
“ side, but should the steamer require to be detached from the  
“ train, and proceed by herself, these rudders will then come into  
“ action.

“ To prevent the train from turning round in descending a  
“ rapid river, should the steamer or first barge happen to get  
“ aground, I apply a mast or pole in the last barge, which can be  
“ immediately dropped through a tube passing from the deck  
“ through the vessel's bottom, and this pole, by engaging the  
“ bottom of the river, anchors the stern of the train, and pre-  
“ vents it from being swung round by the current, and when the  
“ steamer is again ready to advance the pole can be drawn up  
“ by means of suitable arrangements.”

[Printed, 3d. No drawings.]

A.D. 1857, January 5.—N<sup>o</sup> 43.

**HYDE, JOHN MOORE.**—“ Improvements in iron and wooden  
“ ships or vessels, and in the adaptation of the machinery for  
“ propelling the same.” These improvements consist in con-  
structing the after part of iron or of wooden ships in a some-  
what similar manner to that adopted in the invention patented  
the 29th November 1854 (N<sup>o</sup> 2513), but in this case adapting the  
ship for the reception of a propeller of more than one blade : the  
great difference between the present and the former invention  
being that the width of the “ screw post ” is increased, so as to  
admit of the propeller being enclosed, when needful, by suitable  
shutters or sliding plates within the lines of the ship, arrangements  
being made for the free deliverance of the water to the action of

the screw. This arrangement can be adapted to wooden ships by cutting away the dead wood, and then framing the said arrangement with the shutters, &c., into the dead wood; or by adding to the after end of the ordinary stern-post and keel of wooden ships, a frame of iron containing the said arrangement with shutters, &c. "Also I adapt the 'run,' or narrow part of the after ends of  
 " an iron ship, in such manner as to use the same for a con-  
 " denser; this I effect by partitioning off in the interior of the  
 " said parts so as to strengthen the said ship, and at the same  
 " time admit of the condensing chamber thus formed being pro-  
 " vided with a man-hole to allow of its being entered for the  
 " purposes of cleaning, repairs, &c., the efficiency of which con-  
 " densing chamber may be increased by the introduction of pipes  
 " to allow the cold water from the outside the vessel to pass  
 " through the chamber."

[Printed, 5d. Drawings.]

A.D. 1857, January 7.—N<sup>o</sup> 62.

HILL, HENRY CHARLES.—The invention "consists of an im-  
 " proved means of obtaining leverage or mechanical force by a  
 " combination of levers, arranged in an angular position in regard  
 " to each other, and connected together by pins or bolts. This  
 " disposition of the levers constituted the mechanical arrange-  
 " ment known as the lazy tongs." One or more sets of these  
 compound levers are used to effect the raising, lowering, or  
 pressing of various bodies, bending timbers for ship-building, &c.,  
 motion being given to the levers by one or more screws, by rack  
 and pinion, lever, steam, or hydraulic power, or other mechanical  
 arrangement for communicating motion thereto.

[Printed, 1s. 5d. Drawings.]

A.D. 1857, January 8.—N<sup>o</sup> 67.

HUGHES, EDWARD JOSEPH.—(*a communication.*)—The in-  
 vention consists in producing compounds bearing resemblance to  
 gutta-percha, india-rubber, leather, and similar materials, by com-  
 bining fibrine, starch, gluten, or substances containing them, as  
 flour from wheat, peas, beans, &c., with gelatine resins, gum

resins, fats, oils, and substances containing tannin. "Some of  
 " the compounds thus obtained will be applicable to lining  
 " ships, &c."

[Printed at N.° drawings.]

A.D. 1857, January 8.—N° 75.

**TURNBULL, ROBERT.**—"Improvements in cradles for heaving  
 " up ships." The improvements in ships' cradles relate to  
 cradles placed on inclined ways or rails, for heaving or drawing  
 up ships out of the water. The cradle is constructed in parts, so  
 that one part may separate a certain distance from the other, while  
 at the same time the parts of the cradle are suitably tied and held  
 together, to limit the separation, and to keep them in their proper  
 relative position, while either elongated or contracted; when con-  
 tracted, the cradle is considerably less in length than the ship which  
 may be lifted on it. "In placing a ship on the cradle, the parts  
 " of the cradle are brought close together and lowered down the  
 " ways, and the ship brought over it, so as to ground or take the  
 " front part of the cradle with her fore foot a little in front of  
 " the fore part of the cradle, her stern at the time projecting a  
 " considerable distance beyond the after end of the cradle. The  
 " cradle being now hove up on the fore part advances up the ways,  
 " and lifts the fore part of the ship, the after part at the time being  
 " adrift and not on the after part of the cradle. During this time  
 " the other parts of the cradle remain stationary, and until the fore  
 " part has advanced, say, about fifteen or sixteen feet (the limit of  
 " its sliding connecting bars). Having arrived at this limit, the  
 " second part of the cradle follows the first up the ways and sepa-  
 " rates from the after part until it has moved the distance of, say,  
 " ten or twelve feet, as limited by the connecting bars; the whole  
 " cradle now (if in three parts) moves together. By this time the  
 " stern of the ship will be brought immediately over the after part  
 " of the cradle on which she settles or grounds," and is supported  
 in the ordinary way.

[Printed, 104. Drawings.]

A.D. 1857, January 13.—N° 104.

**BOWER, ALFRED.**—The objects of this invention are, "to give  
 " to sailing vessels a greater hold of the water, to enable them to

“ go with greater facility to ‘windward,’ increase their stability  
“ under canvas, and improve their steering qualities.” These are  
to be accomplished by “increasing the width of the lower portion  
“ or the base of the keel, for (say) about three-fourths or four-fifths  
“ of the centre portion of its length, causing the oblique or  
“ angular sides to gradually diminish and die away towards the  
“ extremities into vertical parallel sides.”

[Printed, 7d. Drawings.]

A.D. 1857, January 19.—N° 157.

CLARK, EDWIN.—“Improvements in floating docks.” “This  
“ invention consists in arranging a floating dock so that it may  
“ be sunk in order to receive the ship, and afterwards, having re-  
“ ceived the ship, be floated by pumping the water from the space  
“ between the side of the ship and the interior side of the dock.  
“ By allowing the dock thus to rest on the bottom, I am enabled  
“ to dispense with the air vessels necessary when the ” dock “ is  
“ kept floating while receiving the ship, as heretofore. I construct  
“ for this purpose a pontoon or vessel, consisting of an iron shell  
“ bolted to transverse girders or frames built up of sheet and  
“ angle iron, and also to longitudinal ribs, which connect these  
“ transverse frames. This vessel has blocks bolted on its bottom,  
“ on which it rests when sunk, and its sides are higher than the  
“ draught of the largest ship it is required to dock. When the  
“ floating dock is to receive a ship, it is sunk on a bottom suitably  
“ levelled, and where the depth of water is not so great as the  
“ height of its sides a gate which closes at its end is now opened  
“ and the ship is floated in; the gate then being closed and the  
“ ship suitably shored, the water is pumped out. If the dock is  
“ to be used in a tideway it will not be necessary to make its  
“ sides so high as the draft of the ship to be docked, as it may  
“ then be sunk in water sufficiently deep to rise over its sides,  
“ provided only that its sides be uncovered for a sufficient time at  
“ low water to allow the dock to be pumped out so as to float it.  
“ If the rise and fall of the tide be large it will not be necessary  
“ to provide a gate at the end of the dock as the ship may be  
“ floated over and allowed to settle down into it as the tide recedes.  
“ The dock is furnished with a valve or opening to let the water  
“ run out.”

[Printed, 1s. 7d. Drawings.]

A.D. 1857, January 19.—N° 159.

CLARK, EDWIN.—This invention consists “in a method of arranging machinery for raising ships out of the water for the purposes of examination and repair. For this purpose I erect a series of columns in two parallel rows at some suitable place where the water is sufficiently deep to float the largest ship which it is intended to raise, and I prefer to erect these columns by adopting the system used in bridge constructions, of sinking wrought or cast iron cylinders, or cylinders with screws, and excavating from the interior of them, as is well understood. In connection with each of the columns is a hydraulic cylinder and ram, which by means of descending rods is connected with a girder or girders which extend to the corresponding post in the opposite row. Over this series of parallel girders, which I call a gridron, and between the two rows of columns, the ship to be raised is floated, and the pumps in connection with the hydraulic cylinders are set to work so as to bring each girder to bear against the keel of the ship, which is then shored in the ordinary manner; or instead of allowing the ship to rest directly upon these girders, I prefer placing a strongly-framed platform upon the girders in order more perfectly to distribute the weight of the ship over the girders, and the ship then reposes and is shored up upon this platform. Afterwards the pumps are simultaneously set to work, and the girders are lifted, and are prevented from again descending by closing the water in the presses, or by palls, which fall into suitable teeth formed at intervals on the columns. On each side of the two parallel rows of columns before mentioned I drive piles, on which I build workshops, at or near the level to which the vessel is raised.” A large shallow iron vessel, called a “saucer,” may be laid upon the girders to receive the vessel, with the necessary blocks and shores. The vessel and the saucer being then raised together, the water is allowed to run out of the latter, until it can be floated away with the ship inside it.

[Printed, 1s. 7d. Drawings.]

A.D. 1857, January 22.—N° 198.

ROBERTS, WILLIAM.—“Improvements in arranging ships’ and other similar pumps.” The invention consists in placing

a hollow conical plug at the end of the suction pipe of the pump; this plug turns in a suitable socket like an ordinary cock, and in the sides of the socket are a series of slits, each communicating with one of the pipes with which the suction pipe is to be connected. In the side of the hollow plug is a single slit, which, by turning the plug, can be brought opposite to either of the slits in the socket, and thus communication is made between the suction pipe of the pump, and either of the pipes in connexion with the slits in the socket. In this way the connections of the pump may be changed with much greater facility than by the use of an elbow pipe. Also by embracing with the opening in the plug “two  
“ of the slits in the socket I am enabled to connect together the  
“ pipes communicating with such slits in the socket, and I can  
“ cause the pipes so connected together to work as a syphon.  
“ Heretofore, also, the suction plate has been made separate from  
“ the pump, but I prefer to cast it on and make it part of the  
“ bed plate of the pump.”

[Printed, 6d. Drawings.]

A.D. 1857, January 24.—N<sup>o</sup> 213.

AYLES, THOMAS, and AYLES, ROBERT ANDREWS, junior.—  
The invention “consists in strengthening and making of smaller  
“ dimensions than usual the framework of ships and other  
“ vessels navigating on water, by applying or attaching to one or  
“ both sides of all, or any of the several timbers, iron plates or  
“ bars of iron, whereby the said timbers are much strengthened,  
“ and can be made of smaller dimensions than those used in the  
“ ordinary manner, and thereby allowing more stowage room for  
“ cargo.” Also, “in filling in, solid and water tight, the spaces  
“ between the several ribs or frames of the vessel in certain places,  
“ so as to prevent any water that may accumulate between the  
“ outer and inner planking of the sides or walls and bottom of  
“ the vessel from flowing from one part of the same into  
“ another.”

[Printed, 10d. Drawings.]

A.D. 1857, February 4.—N<sup>o</sup> 329.

HOUSTON, ROBERT HOLMES.—(*Provisional protection only.*)  
—“This invention relates to the application of buoyant cylinders

" or drums for the purpose of supporting and propelling boats, vessels, platforms, or other containing and conveying apparatus, such platforms or apparatus being supported clear of the water or nearly so, instead of being partially immersed therein as is the case with ordinary ships." " If applied as a steamer, such a vessel or conveyance apparatus is fitted up with engines for driving the two shafts of the buoyant cylinders, the frictional contact of which with the water thus affords the necessary propelling power. Provision may also be made for attaching paddle floats to the cylinders to aid the driving action." " Instead of thus driving the cylinders themselves, a screw or other propeller may be employed for this purpose, the cylinders then acting merely as runners. If intended for sailing purposes, the sails similarly afford the propelling power, whilst the cylinders are merely running carriers."

[Printed, 3d. No drawings.]

A.D. 1857, February 11.—N<sup>o</sup> 398.

**PITMAN, JOHN TALBOT.**—(*a communication.*)—" An improved system of working metallic ores and their products, both metallic and mineral " The invention consists of a series of novel constructions and processes for improving " the quantity and quality of the metallic and mineral products obtained by smelting ores and subsequently treating their products "

For this purpose two furnaces, called respectively the alpha and omega furnaces, are constructed, in the former of which the processes are commenced, and in the latter of which they are finished.

In the alpha furnace, " the boshes or lower cone " and the hearth are constructed after the usual manner of blast furnaces, but the upper portion, usually termed the cone or body of the furnace, is built either horizontally or sloping upwards, and is made to enclose a single chamber, or two parallel chambers, varying in length from five to five hundred feet.

When two chambers are used, suitable openings are left in the arch that separates them, through which the current of hot air blast, heat, or flame can pass from the lower chamber into the upper, whilst openings are left in the side walls of both chambers

for convenience in manipulating upon the ores therein, and also to supply air from without to the hot air within the chambers.

The charge of ore introduced within the single chamber is gradually moved forward upon a moveable floor, actuated by suitable machinery, to the belly of the furnace, and thence through the boshes to the hearth. When the double chambers are used, the charge of ore introduced within the upper chamber, descends from the extremity of the chamber, through an opening into the lower chamber, whence it passes, together with the ore of the lower chamber, through the boshes into the hearth.

In order to combine mechanical with chemical action in the smelting process, the ore is introduced into the furnace in the form of perforated or hollow blocks, made of unbroken or pulverized ore, of ore mixed with flux, or of ore mixed with flux and fuel of any suitable character.

The ore, while it is contained in the boshes and hearth, is melted by blasts of any suitable promoter of combustion applied directly into and among the ore through the tuyeres; but while it is passing through the body of the furnace, it is roasted and heated by the escape heat and flame ascending from the boshes.

After the molten products of the ore have reached the hearth in a fused state, they are withdrawn therefrom, either continually or at intervals, into the *omega* part of the furnace, which consists of an open or covered channel, leading directly into a long annealing chamber, so as to allow the molten product to fall into moulds placed upon waggons or casting bed plates moving through the chamber; or the channel may lead into a condensing and refining chamber, built over the annealing chamber, in which case the molten product first passes into the upper chamber, and after being refined therein is withdrawn through suitable outlets upon the waggons passing along the annealing chamber beneath.

When it is desired to make long castings, such as entire columns or entire bottoms for ships, of the molten metallic product, the waggons are to be of corresponding dimensions, and the chamber may be, if necessary, as much as "ten thousand yards" long, and "sixty yards" wide. "Adjustable moveable presses" are to be used within the chamber, for regulating the form, size, or pattern of the casting while it is in a plastic state.

[Printed 1s. 8d. Drawings.]

A.D. 1857, February 12.—N° 409.

ADAMS, WILLIAM BRIDGES.—*Provisional protection only.*)—  
These improvements consist “in the cellular construction of  
“ windows, in which two thicknesses of glass are put into one  
“ frame, or the compartments of frames or sashes, or two sashes  
“ are joined together to produce the same effect, videlicet, a  
“ cellular space between the glasses containing air, which will  
“ materially prevent radiation and increases the warmth of apart-  
“ ments, the glass being fixed in the frames either in the ordinary  
“ modes or by means of elastic or plastic caulking, which will  
“ make air-tight or nearly air-tight joints.” These sashes or frames  
may be used for carriages and vessels, skylights, &c. Instead “of  
“ lapping the joints of the glass, as is usual in skylights, I abut  
“ them against one another with elastic material between them,  
“ and I arrange skylights to fold against each other at their  
“ edges, so as to produce tight joints with easy opening and  
“ closing.”

[Printed, &c. No drawings.]

A.D. 1857, February 21.—N° 516.

GROUSE, MICHAEL.—An improved apparatus for giving  
stability to life-boats and other boats, consisting of a weight,  
suspended at a considerable distance below the boat's bottom, by  
means of a bar on each side of the boat, turning upon pins or  
an axis in the upper part of the boat.

[Printed, &c. Drawings.]

A.D. 1857, March 2.—N° 603.

PEDDER, WILLIAM.—The invention consists “in strengthening  
“ plates, planks, and beams employed to form metallic and other  
“ structures, at the parts of such structures where the ends are  
“ brought together, by means of strengthening joint plates,  
“ having a rib or feather depending or projecting therefrom,  
“ against one side of which feather or rib one end of one plate is  
“ made to but, and against the opposite side of which one end of  
“ the next plate employed in the structure is also made to but;  
“ the projecting rib or feather is of a greater length than the  
“ breadth or thickness of the plates. After the ends of the plates

“ have been made to but against the rib, they are rivetted to the  
“ strengthening joint plate, and the projecting end of the rib is  
“ beaten in to form a solid mass between the plates, and may be  
“ burred down so as to form a rivet over the ends of the plates  
“ on the opposite side to that of the main body of the strengthen-  
“ ing joint plate.”

[Printed, 6d. Drawings.]

A.D. 1857, March 7.—N° 667.

LUNGLEY, CHARLES.—“ An improved mode of constructing  
“ dry docks and basins for the stowage of ships.” “The object  
“ of this invention is so to construct dry docks and basins for  
“ stowing away vessels that such vessels may enter therein at all  
“ states of the tide, and be left high and dry above the level of the  
“ sea or river from which they were floated. To this end, I make  
“ use of the natural level of the land (when that is suitable), and  
“ build up the dry docks or basin thereon in any suitable manner.  
“ When I construct a series of dry docks I connect them all  
“ with a common reservoir or basin, constructed on the same  
“ level, arranging them by preference in groups, the docks com-  
“ posing which lie parallel with each other. These docks I cut  
“ off from the reservoir by means of gates, and I maintain the  
“ water in the reservoir at a spring tide or an artificial height.  
“ The reservoir I prefer to connect with the river or sea by means  
“ of an outer dock or channel provided with double gates, so as  
“ to allow of an artificial height of water being made therein.  
“ The vessel or vessels to be docked I first run into this outer  
“ dock or channel, and having closed the gates I pump in water  
“ until the level in this dock is raised to the level of the water in  
“ the reservoir. I then by opening the inner gates of this outer  
“ dock pass the vessels into the reservoir, and from this I pass  
“ them to their respective destinations in the dry docks. When  
“ they have been floated into their place I close the gates of the  
“ dry docks and run off the water therefrom, and the vessels will  
“ then be in a position for inspection and for undergoing repairs.”  
“ In some cases instead of cutting a channel to form the outer  
“ dock I propose to form it of iron, in such a manner that it  
“ may be floated to its place of destination; it is then to be  
“ secured to the shore, and the dry docks built up upon the  
“ shore level, as above explained.”

[Printed, 1s. 7d. Drawings.]

A.D. 1857, March 17.—N° 744.

ASKEW, CHARLES, ASKEW, JOHN, and MYERS, HENRY.—  
 “Improvements in hydraulic and refrigerating apparatus for the  
 “purpose of raising sunken vessels, anchors, and all other sub-  
 “merged bodies with light and other certain apparatus used for  
 “the same purposes.” The invention “consists of a mode of  
 “arranging hydraulic lifts or pulls, which are placed together  
 “with air pumps on a vessel or vessels or other floating bodies,  
 “and are fixed to such vessel or vessels at the head or stern, or  
 “such other convenient part of such floating body or bodies  
 “found to be necessary.” Powerful screw clutches or claws are  
 attached to the keel of the sunken vessel, to which are connected  
 suspension chains and hook fastenings, and like proper gearing,  
 and which are so arranged as to be acted upon by the hydraulic  
 piston lever, rod, or rods. Common egg-end boilers or flanged  
 tubes are attached to the sunken vessel, or submerged body, for  
 lightening it. These air vessels are worked from a floating  
 raft or frame, to which are also connected a signal bell,  
 whistle, and lamp, communicating by means of a screw valve  
 air tube with the helmet of the diver, and a safety diving cage,  
 fitted with proper piping, stop-cocks, &c., for the purpose of  
 keeping up a constant communication between the floating vessel  
 or other body, and the workmen or divers. “The air pumps  
 “supplying the egg-end tubes or boilers are constructed with a  
 “refrigerator or refrigerators surrounding the same to keep the  
 “pumps cool whilst in active operation.”

Patented 18. 3. 57. Drawings

A.D. 1857, March 18.—N° 766.

TAYLOR, JOHN HERSCHEL.—*Provisional protection only.*—The  
 invention consists in providing an inextensible seat to a spherical  
 valve, or buckets for lifts and other pumps, which seat, as well as  
 being inextensible, is so formed as to prevent the lodging thereon  
 of any substance which may be brought up through it. The valve  
 seat is to be formed of vulcanized or of hardened rubber, or of  
 gutta serena, or of gutta serena faced with vulcanized rubber,  
 and with a knife or sharp edge for the spherical valve or ball to  
 rest upon. This ball may be of metal, or of any other substance.

Also “in forming grooves round the outside of the bracket  
“ (bucket?), and filling or packing these grooves with vulcanized  
“ rubber.”

[Printed, 3d. No drawings.]

A.D. 1857, March 21.—N° 806.

**HYDE, EDMUND.**—This invention has for its object improvements in the manufacture of fabrics from the refuse of the husks of cocoa nuts. Sheets of cocoa nut fibres are to be produced by cementing short fibres together by bituminous cements, such as Stockholm pitch and tar, also by resinous and oil and soap cements; and in order to give body and surfaces to such sheets of fibres, the pulp or dust of the cocoa-nut husk is employed, and made to adhere by cement, by which combination very strong and lasting fabrics are produced, applicable to a great variety of purposes, such as sheathing for ships, for covering roofs and floors, and other surfaces.

[Printed, 3d. No drawings.]

A.D. 1857, April 7.—N° 981.

**PIERCY, FREDERICK, and FLAGG, SAMUEL.**—“A portable  
“ expanding life and military boat, which is also adapted for other  
“ purposes.” The improvements in portable expanding life and military and other boats consist in forming them so that they may be laid quite flat when not in use. They are constructed by preference “of boards or pieces of wood of suitable size and shape,  
“ and of a double thickness, one thickness being placed outside  
“ and another inside of a piece of waterproof flexible material, to  
“ which the wood is fixed with screws, rivets, or otherwise. The  
“ parts of wood are each in themselves rigid, and of a form and  
“ size adapted for the boat required. The bottom is flat and of a  
“ rigid piece; the sides are hinged to the bottom by means of the  
“ flexible material, or may be otherwise hinged thereto in addition.  
“ The ends are each formed of three rigid pieces, one for  
“ either bow (port and starboard), united by a tapered middle  
“ piece, the wide end of which is the width of the bottom, to  
“ which it is closely hinged by the flexible material. The bow  
“ parts of the wood are some little distance from the sides in the  
“ flat, but against which they abut when in the form of a boat.

“ Ribs along each side serve as supports for the thwarts or seats, which, when fixed in position by hooks, straps, or otherwise, sustain the sides of the boat. The bow pieces are hooked or otherwise secured to the sides, which sustain the ends and complete the form of the boat.” Instead of a sheet or sheets of flexible material of the full size of the boat in the flat, that material is sometimes placed only at the rigid parts, where the parts are joined or come together, and the flexible material is carried between the outer and inner thickness of wood or other material to afford the necessary security, or it may be otherwise secured. For life boats a double thickness of air and waterproof flexible material is used, and cross ribs are placed between, keeping them a little apart to form air cells; rigid boards, planks, or pieces of wood are placed on each side, and the parts are arranged and joined as before. “ Instead of wood other suitable material may be employed, and instead of using flexible material the parts of the boat may be hinged in metal and furnished with elastic packings at the joints, so that when formed into a boat the parts shut against each other in a water-tight manner. The advantages of these boats are that they are light and portable, and are easily stowed, and can at the same time be got ready for use with facility.”

[Printed, 10d. Drawings.]

A.D. 1857, April 9.—N<sup>o</sup> 1008.

TURNBULL, ROBERT.—This invention of improvements in slips or ways, and in their cradles, for heaving up or moving ships, relates to ways adapted for moving ships by means of unproved cradles, for which a Patent was granted on the eighth day of January, one thousand eight hundred and fifty-seven. “ By means of my improved slips or ways I am enabled to heave up the ship, and afterwards by means of transverse subways to move the ship transversely away from the heaving up slip. For this purpose I form the cradle in detached sections or pieces, dividing the cradle transversely, but which are readily connected by means of sliding rods or temporary bars of iron or pieces of timber adjusted to permit a certain separation of the parts of the cradle, which I make in parts of ten, fifteen, or other number of feet in length. The sections of the cradle are distributed at equal distances apart under the ship's bottom,

“ and she is hove up on them as on an ordinary cradle. The  
 “ frames or plates of the slip are divided into lengths at distances  
 “ according to the lengths of the sections of the cradle and the  
 “ spaces between them. The alternate parts of the slip are ar-  
 “ ranged, the one series of parts on the solid ground, while the  
 “ next is mounted on rollers, and supported on subways or on  
 “ hollows and rounds placed transversely to the heaving up slip.  
 “ When the vessel is hove up the several sections of the cradle  
 “ rest on the moveable frames or plates of the slip, and when in  
 “ this position the vessel may be moved sideways away from the  
 “ heaving up slip. When so moved the vessel is then shored  
 “ up at those parts between the sections of the cradle; the con-  
 “ necting bars of the several sections or parts of the cradle may  
 “ then be removed, and the cradle traversed transversely from  
 “ under the vessel to its position on the heaving up slip in readi-  
 “ ness to heave up another vessel. By this means great trouble  
 “ and time is saved in taking the cradles to pieces to remove  
 “ them from under a slip as at present constructed.”

[Printed, 7d. Drawings.]

A.D. 1857, April 13.—N<sup>o</sup> 1039.

NEWTON, WILLIAM EDWARD.—(*a communication.*) —“ Im-  
 “ provements in the construction of boats, buoys, floats, or other  
 “ buoyant vessels.” This invention consists “ in the employment  
 “ of gutta-percha, or gutta-percha mixed with common glue and  
 “ other materials in a heated state, and the forming it in previously  
 “ prepared moulds, either so as to complete the desired boat or  
 “ vessel at one pressure and in one entire piece, or to prepare the  
 “ air chambers, ‘timbers,’ supporters, thwarts, and other parts  
 “ separately, and then connect them altogether simultaneously  
 “ and at one pressure, so as to complete the boat or vessel finally  
 “ and at one operation.”

[Printed, 10d. Drawings.]

A.D. 1857, April 15.—N<sup>o</sup> 1063.

COUTTS, JOHN.—(*Provisional protection only.*) —“ An improved  
 “ method of uniting together the parts of all kinds of floating  
 “ bodies composed of metallic substances, as well as vessels for  
 “ containing fluids, gases, &c.” This invention has principally  
 for its object great facility of connecting together the several parts,

of which the above-mentioned floating bodies or vessels are composed, without requiring the aid of skilled workmen, and "caulking." The means by which it is proposed to effect the above object, is by the use and employment of an elastic substance, such as vulcanized india-rubber, gutta-percha, kamtuhcon, and the like, which is placed between the points of junction of the metallic laminæ or substances, which it is desired to unite and render impervious to water, air, or gases. It is proposed also to cover the heads and shanks of the bolts, rivets, &c., with some well-known plastic substance, such as cement used by engineers, gutta-percha, or any other material that can, when in a liquid state, be readily applied around the said bolts, before they are inserted in their respective places. "I also employ an elastic ring or washer around the said bolts, which said ring is compressed against the metal to be united by pressure from a screwed nut fitting upon said bolt, such nut being formed concave on that side which is in contact with the aforesaid washer."

[Printed, 3d. No drawings.]

A.D. 1857, April 15.—N° 1067.

BRUNEL, BONNET FREDERICK.—This invention consists in raising sunken vessels by filling them wholly or partially with gas, where the cabins or interior compartments are capable of holding the gas, or in raising such as are not capable of holding the gas, and other submerged articles, by means of gas-holders connected to them. "The gas which I prefer to employ is hydrogen on account of its superior lightness, and the facility with which it is generated. The apparatus I employ for generating hydrogen gas consists of a cask-like vessel with one bottom or head of wood or other non-metallic substance, and the other of metal. The gas is generated by the action of acid upon two dissimilar metals, the metal head being one of such metals. The vessel is so constructed that when the metal head is placed downwards the gas is generated, while on the contrary if the non-metallic head be placed downwards no electrical action takes place, consequently no gas is produced. It is intended when sinking these gas generators that no action shall take place, or rather no gas shall be produced until the generator has reached the spot where it is to be used. There are suitable cocks and passages for the outflow of the gas."

“ Another apparatus is for caulking any apertures there may be  
“ in the vessel to be raised, when the raising is to be effected by  
“ introducing gas therein. These caulks consist of metal discs fur-  
“ nished on one of their surfaces with an india-rubber crown and  
“ traversed by a cylinder. Flexible moveable syphons are connected  
“ to this cylinder, and allow of the outflow of water through them.  
“ Again, my apparatuses for containing the gas for raising and  
“ buoying up vessels, and other submerged articles, are made of  
“ metal, wood, gutta percha, or caoutchouc. When of non-flexible  
“ or rigid materials they are provided with inlet and outlet valves  
“ or passages, whereby on being placed on the water, water enters  
“ and drives out the air, so as to permit of their being sunk without  
“ effort. When of caoutchouc or other flexible material, I drive all  
“ the air out by folding or rolling them up, and sink them with  
“ facility ; into these apparatuses the gas is introduced.”

[Printed, 2s. Drawings.]

A.D. 1857, April 16.—N° 1078.

SCOWEN, THOMAS LAYZELL.—“ The horizontal fin-expanding  
“ canopy for carriages, boats, and places.” The canopy “ con-  
“ sists of jointed standards, attached or not, or to fit in sockets  
“ (according to discretion) to the carriages, boats, and places  
“ intended for its reception, on which the framework of canopy,  
“ consisting of a centre rail of wood or iron, or both combined, is  
“ attached and supported, and to this centre rail are attached  
“ ribs, which expand according to the shape of the canopy. The  
“ framework when collapsed and let down with the jointed  
“ attached standards will form a back rail to a double seat, such  
“ as seats on roofs of omnibusses, or seats on boats, &c., and can  
“ be raised up and horizontally expanded over the entire roof or  
“ place intended to be covered, with little or no inconvenience to  
“ the passengers. By means of the horizontal fin action the  
“ canopy can be made to any shape required, and expanded or  
“ collapsed at pleasure by the use of screws, levers, springs, and  
“ cords, or by the hand without either screws, springs, or  
“ cords.”

[Printed, 10d. Drawings.]

A.D. 1857, April 22.—N° 1127.

STEEL, WILLIAM.—(*Provisional protection only.*)—"Improve-  
ments in discharging ashes from steamboats" According to  
this invention the ashes from the boiler furnaces of the steamboat,  
are discharged directly through the bottom of the vessel, the  
discharge being effected through a pipe or tube of any convenient  
size or form, opening outwards through the bottom of the vessel,  
and rising internally in the engine room, or near the furnaces, to a  
higher level than that of the water outside. A valve or lid may  
be adapted to the inner end of the pipe, to close it when the ashes  
are not being discharged, or when the water from any cause has  
a tendency to overflow the pipe. "The exit portion of the pipe  
" may be made to incline aft, so that the forward motion of the  
" vessel may produce a sucking action in the pipe, and, if neces-  
" sary or desirable, a constant current may be kept up in the pipe  
" by connecting to it, near its inner end, a secondary smaller  
" pipe, opening through the bottom of the vessel a short distance  
" in advance, so that the forward motion of the vessel may cause  
" the water to rise up the smaller pipe, and flow down the large  
" one. The discharge pipe may be made with an enlargement,  
" into which any suitable valve, such as a floating ball valve, may  
" be introduced, for the purpose of closing the pipe in case of any  
" sudden ingress of water taking place."

[Printed, 3d. No drawings.]

A.D. 1857, April 22.—N° 1136.

GRANTHAM, RICHARD BOXALL, GRANTHAM, JOHN, and  
SHARP, HENRY.—(*Provisional protection only.*)—Improvements  
in "graving docks, so that vessels of various lengths and dimen-  
" sions requiring different periods of time for their repair may be  
" accommodated in the same dock without any loss of space, or  
" without causing interruption to all, when one or more vessels  
" being completed require to be let out." "The improved  
" graving docks are to be constructed in the same manner as  
" heretofore, with gates, caissons, or other moveable dams at their  
" entrances into and out of floating docks, tideways, rivers, or  
" basins in such places as may be deemed necessary and expe-  
" dient." It is "proposed to construct them with piers and

“ abutments, or with grooves only, at various intervals along the  
“ docks, so that a moveable caisson or other dam may be applied  
“ to either of such piers, abutments, or grooves as the length of  
“ the vessel may require; and it is intended that the chambers  
“ thus made should be provided with the necessary blocks, stays,  
“ or struts, and that there should be culverts provided with the  
“ necessary valves, sluices, and other means for stopping out or  
“ letting in the water upon one or both sides of each chamber,  
“ so that water may be let out from the chamber or chambers  
“ above or within the docks nearest to the entrance when the dam  
“ is closed, and also to let water in to float the dam as well as the  
“ vessel within each chamber, to enable the dam to be moved  
“ away and the vessel to float out, the water being let in or out  
“ by pumping or other means.” “It is also proposed, where  
“ convenient, to have an entrance at each end of such graving  
“ dock.”

[Printed, 3d. No drawings.]

A.D. 1857, April 28.—N<sup>o</sup> 1194.

**SUTHERLAND, KENNETH LEITH.**—(*Provisional protection only.*)—The invention consists in constructing a safety candle lantern, particularly suited for ship purposes, in the following manner:—The lower part of the lantern is formed of a metal cylinder, open at top, and fitted with a socket at bottom for the reception of the candle holder, which consists of a case containing a coiled spring, and a cap to keep the candle in the case upon the spring. The cap is fitted in the manner usually followed in candle lamps, and under the cap there is fixed a perforated disc, to which is soldered a wire rising upwards, by which to take out the candle holder when required. From the metal cylinder there rise four or more metal rods, which support a flat metal ring, and between two of these rods there is soldered a plate, which acts as a reflector, and has attached to the outside thereof another plate which carries a pair of handles; the top of the plate has also affixed to it a loop, by which the lantern may be hung. A ledge in the form of a wire is soldered round the upper part of the metal cylinder and inside it, to receive a glass cylinder or chimney, the top of which reaches and lies inside the flat metal collar. To the upper part of this collar there is fitted a hinged top, which on being closed keeps the glass cylinder in position, and also

the wire attached to the candle holder disc. The cover may be locked or closed by a screw worked by a key or otherwise. Apertures are formed in the metal cylinder for the admission of air, and in the cover for the escape of the products of combustion.

[Printed, &c. No drawings.]

A.D. 1857, April 30.—N° 1221.

**POWERS, GEORGE.**—The invention consists “in constructing  
“ scuttles mainly in two parts, so as to be capable of admitting  
“ light and air, or of being used for ventilation only, one part  
“ being a fixed frame and the other capable of being moved.  
“ The fixed frame is divided into four equal parts; two of these  
“ parts are glazed and the other two open. The moveable frame  
“ is connected by a pin to the centre of the fixed frame, and its  
“ periphery works within a flange upon the fixed frame; it is  
“ capable of being moved round this pin as a centre to the extent  
“ of one-fourth of a revolution. Two parts of the moving frame  
“ are glazed and the remaining parts are open. Upon the  
“ periphery of the moveable frame there are teeth or cogs, into  
“ which the teeth of a toothed pinion, worked by a key from the  
“ inside of the cabin, take. When the light is closed the glazed  
“ parts in the moveable frame are opposite to the open spaces in  
“ the fixed frame, and the glazed parts of the fixed opposite to  
“ the open spaces in the moveable frame, thus forming a water-  
“ tight scuttle. But in order to admit air the moveable frame is  
“ worked round, so as to bring the open spaces in the two frames  
“ opposite to each other, and the extent to which the frame is so  
“ moved determines the amount of air to be admitted.” A  
wooden or metal cap or dead light, may be placed over the rim or  
flange in which the moveable frame is held. Where light is  
not required to be admitted, the spaces in each frame, instead  
of being glazed, may have metal plates fitted in them.

[Printed, &c. Drawings.]

A.D. 1857, April 30.—N° 1224.

**BOUSFIELD, GEORGE TOMLINSON,**—(*a communication from Nathan Thompson, junior.*)—Improvements in collapsible boats and pontoons. This boat resembles somewhat in appearance, and is

“ in many respects similar in construction to a collapsible boat for  
“ which Letters Patent were granted to the said Nathan Thompson  
“ on the twenty-third day of February, one thousand eight hundred  
“ and fifty-five, but is stiffer and less liable to capsize when opened  
“ and ready for use,—is also stronger and works less in a sea-way,  
“ —is not as expensive in construction,—is of less weight for any  
“ given size,—and has more room for stowage.” In the construction of the boat, two sides are employed, each usually composed of three pieces, one of which is the centre piece or side proper, and the other two constitute the bow and stern. These sides may be constructed of thin planks framed together in any proper way, or of metal, corrugated or plain, of any usual construction, and may be provided with air chambers, or have such attached, or may be protuberant to receive a cork filling. The centre pieces are hinged to the bow and stern pieces by strong hinges, and a piece of vulcanized india-rubber cloth, or strong canvass, or some similar material, is attached to each of the meeting edges, so as of itself to form a hinge, and to make the joints watertight. On the inner sides of the bow and stern are secured strong eyes through which an eye bolt is passed, and secured by rivetting or otherwise. This bolt and the eyes hinge the two sides of the bow and stern together. The bottom is in two pieces, hinged together along the centre by canvass or rubber, metallic hinges being also applied to increase the strength, if deemed necessary. The edges of the bottom, at the bilge of the boat, are also hinged to the centre pieces of the sides by canvass or rubber; a rabbet or ledge is also to be formed all round the inner part of the sides for this bottom to rest upon when the boat is expanded. The two pieces of the bottom may be made so broad, that when the boat is fully extended, there shall still be a ridge along the middle of the bottom, the two sides forming an angle with each other. At the angles formed by the sides and bottom strong braces are attached by hinged joints. These braces, when brought into a straight line, lie along and in contact with one or other half of the bottom, keep the sides distended, hold the bottom down, and brace the boat so as to prevent wearing or twisting of the sides. Flaps of sheet rubber, rubber cloth, or some similar material, flexible and wholly or partially waterproof, are secured to the sides, and also to those parts of the bottom which abut (when the boat is open) against the bow and stern pieces. These flaps constitute a flexible side within the rigid

bow and stern pieces, covering the slit or aperture between them, and also form a flexible junction between these pieces and the bottom. In order to protect these flexible pieces from wear, and also to hold the bottom down when the boat is expanded, it is proposed to attach to the bow and stern pieces, by suitable hinges, certain hinged pieces or shutters, which, when the boat is collapsed, lie along the bow and stern, but when the boat is opened out ready for use, are to be forced down with their lower edges resting against and preventing the rising of the bottom. Pontoons may be made on a similar principle.

[Printed, 10d. Drawings.]

A.D. 1857, May 1.—N° 1231.

JOHNSON, JOHN HENRY,—(*a communication from Messieurs Trève and Felix Pitel*).—"Improvements in apparatus for preventing collisions at sea." This invention relates to an improved alarm sounding signal, and consists "in the application" and use of a whistle similar to a locomotive whistle, but in place of this whistle being in connection with a steam-engine boiler, and sounded by the action of the steam, it is placed in communication with a compressed air reservoir, and is sounded by the action of the compressed air therein. A force pump is fitted to the air vessel for the purpose of keeping up the pressure. By using compressed air in place of steam the whistle may be applied to sailing vessels in lieu of being confined to steamers, and the power of the blast and consequent degree of sound may be regulated to any extent."

[Printed, 3d. No drawings.]

A.D. 1857, May 2.—N° 1240.

PATERSON, ALEXANDER JOHN.—The invention consists "in constructing vessels with pointed or conical drums, of about the same sectional area at their broadest parts as that of the vessels themselves, to form the bow and stern, or either bow or stern, and with screw blades upon the outer surfaces thereof. These hollow screw drums being made to rotate, will draw and drive or propel the vessel to which they are connected, and of which they form part."

[Printed, 1d. Drawings.]

A.D. 1857, May 9.—N° 1315.

**PYM, JOHN.**—“This invention relates to the raising or the raising  
“ and lowering of bodies or weights, particularly floating shoaled  
“ or sunken ships or other vessels, or the parts or machinery  
“ thereof, by means of a double or duplex ship, or other floating  
“ vessel, capable of separation, and forming when separated two  
“ distinct ships or other floating vessels, fitted with double sheers  
“ capable of being connected and having pendant chains and  
“ other suitable tackle and apparatus, which are or may be worked  
“ by steam or other machinery.”

[Printed, 10d. Drawings.]

A.D. 1857, May 16.—N° 1391.

**OGLE, NATHANIEL.**—(*Provisional protection only.*)—“An im-  
“ proved method of propelling and ventilating ships.” The  
invention consists “in the employment of air engines or pumps  
“ as intermediate agents between a steam engine or other prime  
“ mover when the propellers consist of pistons working in a tube  
“ or cylinder open to the water.” By this arrangement the ship  
may also be ventilated, as fresh supplies of air are continually  
drawn down to the air engines or pumps, while the propelling  
apparatus is in operation.

[Printed, 3d. No drawings.]

A.D. 1857, May 22.—N° 1449.

**ENGLEDUE, JOHN RALPH, and CULLIS, WILLIAM.**—(*Pro-  
visional protection only.*)—“Improvements in ventilators for  
“ ships’ cabins, apartments, and places.”

Two frames made of wood or other suitable material are secured  
together by set screws, each frame containing curved pieces of  
zinc, so arranged, that when the two frames are secured together by  
the set screws, the pieces in the one frame will form the concavities,  
and the pieces in the other frame the convexities of a continuous  
undulating surface; or by separating the frames a short distance,  
the continuity may be broken and ventilation secured, while there  
is still an obstruction to the passage of light.

[Printed, 3d. Drawings.]

A.D. 1857, May 25.—N° 1469.

**SZERELMEY, NICOLAUS CHARLES.**—(*Provisional protection only.*)—"Improvements in preparing combinations of materials for coating wooden and iron ships or vessels."

The four following compositions are to be applied successively on the bottoms of wooden ships. The first composition is to be omitted when the bottom is of iron, or is sheathed with zinc or copper.

First composition. In 58 lbs. of lime water, boil 6 lbs. of alum, and 3½ lbs. of sulphate of copper.

Second composition. In 18 gallons of linseed oil, boil 2 lbs. of common Prussian blue, 4 lbs. of copperas, and 4 lbs. of brown umber.

Third composition. Take ashes of coal, 10 lbs.; burnt argillaceous earth, 10 lbs.; calcareous silex, 10 lbs.; pulverize it, and add water till the whole is reduced to a thick paste: then grind this paste and dry it again in the air; afterwards add to this substance 2 lbs. of litharge, 2 lbs. of sulphate of copper, and a portion of the second composition.

Fourth composition. Melt 30 lbs. of asphalt, 3 lbs. of brown umber, 3 lbs. of red lead, and 3 lbs. of gum animi. When these ingredients are melted, add 5 gallons of linseed oil, and let it boil till it becomes quite thick, then take it from the fire and add 2 lbs. of sulphate of copper, and as much turpentine as is necessary for painting.

[Printed, 3d. No drawings.]

A.D. 1857, May 27.—N° 1481.

**COOK, JAMES EDGAR.**—The invention consists in manufacturing a poisonous composition, wherewith the copper or metallic sheathing of wooden vessels, or the bottoms of iron vessels may be coated prior to their putting to sea, the composition "being eminently destructive to animal and vegetable life, for upon the adhesion of either to the metal it is immediately killed and falls off, or is washed therefrom by the action of the water, leaving the surface of the sheathing clean, and the sailing qualities of the vessel unimpaired. This composition is also applicable to the coating of wood to preserve it from decay, and prevent the ravages of

“ worms, beetles, and other destructive insects.” The composition is made up of wood spirit, or methylated spirits of wine, shellac, strychnine or atropia, and dragon’s blood, in the general or average proportion of “ 1 gallon of wood or methylated spirit, in which “ is dissolved 4 to 8 lbs. of shellac, from half a drachm to two “ drachms of either strichnine or atropia, and from 8 oz. to 1 lb. “ of dragon’s blood, or other suitable colouring matter.”

[Printed, 4*l*. No drawings.]

A.D. 1857, May 27.—N° 1504.

DANNE, LOUIS JOSEPH ALMIDOR.—(*Provisional protection only.*)—“ Manufacturing gutta-percha glue, and applying the said “ glue to various new purposes.” The proportions to be used in making the glue are “ gutta percha, one pound ; rosin, one pound ; “ litharge, one ounce ; and an adequate quantity of powdered “ glass.” By modifying its composition, and mixing with it some other hard material, according to the requirements, the glue can be applied to various purposes, such as caulking of ships, &c.

[Printed, 3*l*. No drawings.]

A.D. 1857, June 3.—N° 1560.

ROBERTSON, CHARLES.—(*Provisional protection only.*)—An apparatus “ for scraping the bottoms of iron ships while under “ way or laying in a stream, for the purpose of removing any “ accumulation of barnacles or sea-weed that may have adhered “ thereto, and without the necessity of using boats, the whole “ operation being performed by the crew from the deck of the “ vessel.” It consists of one large box scraper, and several small triangular scrapers attached to chains or ropes, the scrapers being kept in contact with the bottom, as they are hauled to and fro, by the current of water.

[Printed, 3*l*. No drawings.]

A.D. 1857, June 5.—N° 1586.

JORDAN, JOHN.—(*Provisional protection only.*)—“ Improve- “ ments in the construction of iron ships or vessels.” The invention consists in constructing vessels with a water-tight inner ceiling of iron, “ extending from the upper to the lower deck and connecting “ it with a water-tight lower deck of iron, so as to form a perfectly “ water-tight chamber within the ribs of the vessel, the hatches

being so constructed that they may be packed and made perfectly water-tight so that should the lower hull become filled with water by accident, the vessel will be sustained by her buoyancy above the lower leak, and by which arrangements vessels so constructed are greatly increased in strength." When the invention is applied to small vessels not requiring between-decks, it is proposed to make safety arrangements capable of floating and sustaining the vessel in case of accident by fitting the fore-castle and main and mizzen masts with by lifting the water-tight decks joined to the two water-tight bulkheads, and working in the water-tight mast part of the vessel and forming the frame of an iron box, the making as in were life buoy of the vessel, fore-castle and stern.

Printed by S. W. LONDON.

A.D. 1857, June 3.—N<sup>o</sup> 1611.

NEWTON, WILLIAM EDWARD.—*a communication*.—An improved lifeboat consisting in "a cap vessel or boat for receiving goods and passengers, and which is supported upon the elevated platform, and is so constructed as to be raised from the side of the vessel at the wharf and at various points in the length of the said vessel, which are placed parallel to each other. The cap vessel or boat is raised on supports high above the general surface of the water, and therefore forms a safe and comparatively dry place for the conveyance of passengers and goods from vessels to the shore. Between the parallel floats is placed a paddle-wheel which is connected in its axis with a water-tight casing, so as to keep out water from the boat. This paddle-wheel may be driven by gearing actuated by manual labour. A rudder mounted in a suitable rudder frame is also adapted to one end of the vessel, and pumps communicating with the interior of the hollow floats are provided for the purpose of pumping out any water that may leak into the hollow floats."

Printed by S. W. LONDON.

A.D. 1857, June 10.—N<sup>o</sup> 1634.

NEWTON, ALFRED VINCENT,—*a communication*.—"Improvements in the construction and mode of propelling and steering navigable vessels." This invention relates, firstly, to the construction of navigable vessels, whether built of timber or iron.

The shape of these vessels “in plan view is that of an isosceles triangle, and they are made with vertical sides and a flat bottom, the base or that side of the triangular figure, at whose ends are the two equal angles, constituting the stern of the vessel, and the opposite angle the bow. The advantages of this form are, that it gives a very light draught of water with great carrying capacity, makes a vessel of great strength for the weight of material employed, and is constructed entirely of straight material, requiring neither keel nor stern post.”

Secondly, to an improved system of propulsion, consisting in the expulsion of air from a chamber or chambers within the stern of the vessel, through an opening or openings extending the entire width of the stern below the surface of the water.”

And, thirdly, to the mode of steering such vessels, by means of one or more rudders operating within the air chamber in the stern of the vessel, to give direction to the escaping air which is the propelling agent, and thus direct the motion of the vessel.”

[Printed, 7d. Drawings.]

A.D. 1857, June 20.—N<sup>o</sup> 1729.

CLARK, EDWIN, and TUCK, JOSEPH HENRY.—(*Provisional protection only.*)—“This invention has for its object improvements in blocking or supporting ships and other vessels for the purpose of docking them. For this purpose, blocks are employed which are drawn by tackle towards the keel of the vessel to be blocked, until they bear against the side of the vessel, and the blocks are prevented from receding after having been drawn up by racks or similar contrivances on the floor of the dock or surface on which the blocks work, into which racks, pawls carried by the blocks, fall. The blocks are employed in sets of two or more, one working on the top of the other, and when the first block has been drawn against the ship, and becomes fixed by its pawls, then the block above is similarly drawn forward on the lower block, till it comes against the side of the vessel, where it becomes fixed by its pawl falling into the teeth of the rack on the lower block. In order to draw the blocks forward chains are employed, which are connected at one end to the blocks, pass round pulleys ahead, mounted on the surfaces on which the blocks work, to barrels so arranged that they can be worked from the

“ surface of the water, by means of a key fitting on the axis of the  
 “ barrel, which is made square for the purpose. For working  
 “ two blocks, one on the top of the other, the axis of the top  
 “ barrel is made tubular, and the axis of the bottom barrel passes  
 “ through it. When the key is first put on, it fits on the axis of  
 “ the bottom barrel, the key being prevented from descending  
 “ lower by a catch; and when it is desired to act on the upper  
 “ barrel, the catch is withdrawn by a cord, and the key falls on to  
 “ the square head of the upper barrel.” “ In order to support the  
 “ ship or other vessel more securely, when raised on a ‘ saucer ’ or  
 “ pontoon, and blocked as already described, telescopic shores are  
 “ employed, and these are formed of two parallel beams of timber,  
 “ hinged at one end to the side of the ‘ saucer ’ or pontoon, and  
 “ having between them a third beam capable of sliding in and  
 “ out. In using this shore, it is drawn out to the required extent,  
 “ and by a rack and pawls, or other similar contrivance, it is  
 “ prevented from slipping back.”

[Printed, 3d. No Drawings.]

A.D. 1857, June 24.—N° 1768.

SANDERSON, CHARLES.—“ Improvements in the manufacture  
 “ of railway bars, girders, and other articles requiring great  
 “ strength and stiffness to resist pressure, concussion, or strain.”

“ Hollow rails, bars, or other similar articles, or sheets, or  
 “ plates, may be made of steel, or steel and iron combined.  
 “ Either of these articles may be made from a bloom of metal,  
 “ consisting either of steel alone, or steel combined with iron,  
 “ rolled or reduced into the form of a sheet, of the required  
 “ width and thickness. Sheets made of steel, or steel and iron  
 “ combined in this manner may, when rolled to the required  
 “ thickness and properly hardened and tempered, be employed  
 “ either for constructing tubular bridges or for ship building or  
 “ boiler making, or other purposes to which such material may  
 “ be applicable.”

[Printed, 10d. Drawings.]

A.D. 1857, June 26.—N° 1795.

BOURNE, JOHN.—This invention is the same as that described  
 “ the Provisional Specification of the 1st January, 1857, ex-

cepting in the following particulars which are additional, viz.:—that the steamer may be propelled by a single paddle wheel at the bow instead of the usual paddle wheels at the sides, this wheel projecting below the bottom and clearing a passage for the vessel by removing the sand; also, to enable the different constituent barges of the train to be steered in unison, a dial set in a conspicuous position in the first barge shows the amount of deflection they ought to observe, and the track they ought to pursue; and to enable the train to ply by night, a powerful lighthouse is placed in the bow.

[Printed, 1s. 10d. Drawings.]

A.D. 1857, June 26.—N<sup>o</sup> 1801.

HEYWOOD, BENNETT JOHNS.—(*Provisional protection only.*) “Improvements in the manufacture of india-rubber goods.” The invention consists in combining in their green state vulcanized india-rubber compounds, “prepared so as to retain respectively, “when cured by the application of heat, permanent elasticity and “rigidity,” and thus producing a flexible or semi-flexible material, that will not be liable to collapse when made up into hollow articles, such as hose for fire-engines, trunks, cases, boats, &c.

[Printed, 3d. No drawings.]

A.D. 1857, July 2.—N<sup>o</sup> 1838.

SMITH, ANDREW.—(*Provisional protection only.*)—“Improvements in the construction of life boats, and other boats or “vessels.” The invention consists in constructing the shell or body of the boat or like vessel of wire gauze, moulded to the required form, and in covering this shell with leather, gutta percha, mackintosh fabrics, or other suitable waterproof materials.

[Printed, 3d. No drawings.]

A.D. 1857, July 3.—N<sup>o</sup> 1859.

MEARS, HENRY D., and HOULTON, WILLIAM, junior.—The invention consists “in a device for sealing freight cars, express “ chests, custom-house packages, wine cellars, mail bags, hatches “ of vessels, &c., in such a manner that they cannot be opened “ without the seals being so violated as to render detection cer-

“tain; said device being the employment of one or two impressible metallic discs for the purpose of receiving and holding fast the ends of a wire, strip, tape, or string, which has been passed through staples on the door and door frame of the apartment to be sealed, said discs being made to grasp firmly each other on any intervening or inserted substance, by compression produced by a blow from a die, or by the action of pincers, or any equivalent means, which blow or compression at the same time fixes upon the die to which it is applied an inscription or seal.”

[Printed, 6d. Drawings.]

A.D. 1857, July 8.—N° 1900.

**BAHN, LOUIS ALBERT.**—(*Provisional protection only.*)—“This invention consists in the manufacture and application to the purposes of sheathing for ships, boiler plates, tubes, and other similar purposes, of metallic alloys, composed of copper, tin, and spelter; the articles manufactured from these alloys being afterwards galvanized.”

[Printed, 3d. No drawings.]

A.D. 1857, July 8.—N° 1903.

**MOORE, ROBERT.**—(*Provisional protection only.*)—“This invention consists, firstly, in employing tubular metallic keelsons of a cylindrical, oval, elliptical, or spheroidal section, secured longitudinally upon the frames or floors of the ship, which tubes will be applicable to surface condensation, when steam is used as a motive power in propelling the ship. Also in using corrugated iron and cast-iron braces, either in combination or separately, for longitudinal and transverse bulkheads; and a fastening called a top side bracing, consisting of an angle iron under the knees for the whole or part of the sheer, some or all of which are secured either by being in part formed so as to be riveted to this angle iron, or by separate connecting pieces for that purpose.”

Secondly, in an arrangement for partially lowering and raising the shaft and screw “to vary the elevation of the axis of rotation for the purpose of working in deep or shallow water, whereby in a sea-way a screw of larger diameter can be worked than could be employed in ports, rivers, or other shoal water.”

Thirdly, in suspending in the ship a closed cylindrical or other vessel of suitable dimensions and form, filled or partly filled with spirits of wine or other suitable fluid, and containing “a combination of magnets, consisting of three or more, secured to buoyant frames, which acting both combinedly & in some respects independently, will, from the mean of several simultaneous observations upon certain well-known principles of magnetic or electro-magnetic influences, furnish a correction, or an estimate very nearly correct, of the magnetic deviations caused by local attraction.”

[Printed, 3d. No drawings.]

A.D. 1857, July 9.—N° 1909.

RUSSELL, JOHN SCOTT.—“Improvements in apparatus and slips for moving ships and vessels out of and into the water.” These improvements consist “in constructing slips and the apparatus connected therewith so that the keels of the ships to be raised or moved thereon may be received on to the slips and apparatus in a line transversely of the fixed ways or rails of the slip, and where the extent of frontage is considerable it is desirable to construct the carriages used to receive the ships of several parts, each capable (by its chain and capstan, or other tackle or mechanical power used therewith) of being moved up and down the fixed ways or rails of the slip, and also of being used conjointly with other of the carriages when the length of the ship to be received and moved thereon requires the combined use of several. By such means of constructing slips and apparatus for moving ships and vessels several advantages are derived over those constructions of slips and apparatus where the keels of the ships are received and moved parallel with the fixed ways or rails of the slips.”

[Printed, 3d. No drawings.]

A.D. 1857, July 9.—N° 1913.

DELMAS, FLORENTIN.—(*Provisional protection only.*)—“Improvements in ventilating ships, mines, and other places.” “The interior of the ship is furnished with pipes pierced with holes; these pipes are adapted to receivers placed in communication with the exterior column of air through which the ship passes,

“ and each receiver, by the forward motion itself of the ship,  
 “ receives a column of air, which is carried and distributed in the  
 “ interior of the pipes. The number of these exterior receivers  
 “ may be increased as much as desired, and they can be put in  
 “ communication with pipes, arranged according to the greater or  
 “ less circulation of air required. The mouths of the exterior  
 “ receivers, placed on the level of the deck above and below, may  
 “ be of different shapes, but always so covered as to be sheltered  
 “ from the water. All these pipes correspond or communicate  
 “ with one or several openings at the stern of the ship for the  
 “ escape of prejudicial or unhealthy air and gases, which are  
 “ generally heavier than air.”

[Printed, 3d. No drawings.]

A.D. 1857, July 18.—N° 1993.

NEWTON, WILLIAM EDWARD,—(*a communication.*)—“ Im-  
 “ proved machinery for cutting metals or other hard substances.”  
 The object of this invention is to obviate defects in rotary shears.  
 “ This is effected by dispensing with the top beam, and supporting  
 “ the carriage on which the moveable blade is mounted entirely  
 “ on the frame that contains the stationary blade, and by so  
 “ gearing the carriage and rotary shear blade in it, that their  
 “ relative velocities can be changed to produce the amount of  
 “ drawing cut requisite for the machine to work to the best  
 “ advantage.”

[Printed, 10d. Drawings.]

A.D. 1857, July 24.—N° 2030.

WILLIAMS, THOMAS,—(*Provisional protection only.*)—“ An  
 “ improvement in the construction of ships or vessels, whereby  
 “ their draught may be regulated ” “ My invention, which has  
 “ for its object to improve the form and construction of vessels  
 “ with the view of rendering them available for navigating deep or  
 “ shallow waters at pleasure, consists in forming within the hull  
 “ or hold of the vessel one or more watertight compartments  
 “ arranged longitudinally in the line of motion of the vessel, so as  
 “ to enclose or surround an inner case or chamber for containing  
 “ a portion of the cargo, the said inner case or chamber being

“ raised or lowered when necessary for regulating the draught to  
 “ the depth of water by means of pneumatic or other suitable  
 “ apparatus.”

[Printed, 3d. No drawings.]

A.D. 1857, July 27.—N<sup>o</sup> 2037.

**WILLIAMS, WILLIAM.**—(*Provisional protection only.*)—“ Im-  
 “ proved graving slips for the repairing of ships.”

The proposed slip is to commence at a sufficient depth of water to allow the vessel to be placed on the intended cradle. This cradle is constructed principally of wrought iron with two or three ribs on each side, “to be raised up nearly perpendicular to  
 “ the height of the deck of the average of vessels intended to be  
 “ placed on the cradle; these ribs to have regulating screws,  
 “ fixed in a slot or groove, to be moved to any height required,  
 “ for the purpose of accurately fixing the vessel on the centre of  
 “ the cradle.” The cradle, with the vessel thus secured, is to be drawn up by the aid of powerful machinery to the top of the incline. This portion of the incline is to be a lifting bridge, secured by a hinge joint at the top end, and the bottom end is to be lifted by the aid of an hydraulic press, so as to bring the bottom end on a level with the other. “Thus the vessel and  
 “ cradle are placed on level ground, and may be drawn to any  
 “ distance required. The ground adjoining is to be laid out for  
 “ shipwrights’ yards, with iron plates or rails, at right angles to  
 “ the proposed slip, so that the vessel when removed opposite to  
 “ any particular yard, to be repaired, may be drawn by means of a  
 “ crab, winch, or otherwise along the rails laid down for that  
 “ purpose.”

[Printed, 3d. No drawings.]

A.D. 1857, July 27.—N<sup>o</sup> 2043.

**RIDSDALE, JOSEPH.**—(*Provisional protection only.*)—The invention consists “in forming the frames of scuttles, whether the  
 “ frame by which the scuttle is connected to the ship’s side, or  
 “ the frame in which the glass is fitted, hollow, and in making  
 “ one, two, or more apertures externally therein, which lead into  
 “ one or more apertures opening internally; the internal aper-  
 “ tures are all furnished with a valve or stopper, for the purpose

“ of closing them when requisite;” the object of the invention being “ the admission of air without the liability of water “ entering with it, at such times as the scuttle itself cannot be “ opened.”

[Printed, 3d. No drawings.]

A.D. 1857, July 28.—N° 2063.

BETHELL, JOHN.—The invention consists in building ships and other vessels of a combination of iron ribs and wooden planks, fixed together by metal bolts and screws, and further cemented together by a composition or glue, so that the iron ribs and the planks are firmly combined together into one solid mass. “ The “ ribs to be employed may be formed either of rolled bar angle iron “ or T iron,” and a number of such iron ribs are to be placed at short distances apart from each other, throughout the length of the intended vessel, with the head of the T, or the flat face of the angle iron rib presented towards the exterior, each rib being previously, or at the time of construction, bent into the required curve or form, in accordance with the intended variation of transverse section. The skeleton of the vessel being thus formed, wooden planks, previously creosoted, are to be rivetted, bolted, screwed, or secured to and against the exterior of the iron ribs, the rivets, bolts, or screws, either passing through the ribs and outside planking only, or also through an inner wooden planking. This inner planking, which is to be employed in both of the cases referred to, and which may be creosoted or not, consists of short lengths of plank cut to fit exactly between the ribs, and faying against the inner surface of the outer planking, and against the interior of the ribs. It is to be fastened to the outer planking by cement or glue, and may be further secured by screws. There may also be an interior ceiling or lining of wooden planking, fastened by spikes or nails.

One of the glue compositions or cements employed, consists of a mixture of shell lac and the fluid creosote oil used for preserving wood, and the other of two parts of pitch combined with one part of gutta percha. The edges of all the planks are to be glued together by this glue instead of caulking.

The improvements further comprise “ the connecting or joining “ the deck or decks of ships or vessels, or the main timbers sup-

“ porting the deck or decks to and with the keel or keels by  
“ means of lattice or other framing, whereby considerable stiffness  
“ and strength are obtained, the deck or decks and the framing,  
“ and the keel or keels, being firmly connected together, and  
“ thereby constituting a girder running longitudinally through  
“ the ship or vessel, or through portions of the same.” This  
framing is to consist of upright and diagonal pieces of wood or  
iron, arranged as struts, and tenoned into the longitudinal timbers,  
with iron tie rods, holding the several parts together. Plates or  
sheets of iron, or keels of wood only, may however be employed  
to constitute or make up the girder or portions of the same, in-  
stead of this compound iron and wooden framing.

[Printed, 7d. Drawings.]

A.D. 1857, July 29.—N<sup>o</sup> 2068.

JONES, WILLIAM EDWARD.—(*Provisional protection only.*)—  
“ Improvements in the manufacture of iron plates, such as boiler  
“ plates and plates for ship building and other similar purposes,  
“ and also in machinery for the manufacture of such plates.” It  
is proposed to construct “ the description of plates above named  
“ with extra thicknesses at certain parts, so as to give increased  
“ strength of metal at the point where the plates are punched for  
“ rivets, without increasing the total weight of iron in each  
“ plate.” It is proposed also that the collars of the rolls should  
be furnished with a circular shear or cutting edge, so that the  
plates may be cut and trimmed during the operation of rolling.

[Printed, 3d. No drawings.]

A.D. 1857, August 14.—N<sup>o</sup> 2167.

GUMM, CHARLES.—(*a communication.*)—This invention “ re-  
“ lates to improvements in the construction of life boats, and  
“ consists in forming a boat with her bottom deeply bellied or  
“ curved, having each end so high above the water as to prevent  
“ the sea breaking into her; this shape will enable her also to  
“ ride more easy in the sea and meet the waves with greater ease  
“ and safety. Instead of being built upon a keel, she should be  
“ built upon a plank about one foot wide in the middle and nar-  
“ rowed at each end.” A ballast or water tank is to be fitted in

the bottom of the boat, and she is to be provided with chambers at each end filled with cork shavings, so that if she capsized she would rest upon the cork chambers at the ends of the boat, when the weight of the water tank would cause her to right herself.

[Printed, 8d. Drawings.]

A.D. 1857, August 19.—N° 2197.

WALL, ARTHUR.—“Improvements in amalgamating metals.”  
 “The amalgam or amalgamation forming the object of my invention consists in alloying or amalgamating metals, and forming a compound that will offer a successful resistance to the action of either simple or compound atmospheres (such as air and sea-water, or air charged with sulphurous or other acid gases), in the proportion of from 1 to 2 or 3 times greater than the resistance offered by any or either of the normal metals used in my alloy or amalgam when taken separately. To obtain these results, I melt copper in a crucible, in combination with any of the ordinary fluxes; and in another crucible I melt lead and zinc, at the ordinary temperature for melting these metals, and add bismuth and mercury. When all are in a proper state of fusion, I empty the contents of one crucible into the other, and then remove them from the fire.” “The proportions I use for rolling are about as follows: Of lead 87, zinc 9, copper 2½, mercury 1, and bismuth ½; total, 100 parts.

Sheets of zinc, copper, or lead may be covered with the protective amalgam by an electrotyping process, two or more metals being deposited, of which the mercury is always the outer one.

“Oxidation of metals going on in sea water according to their negative or positive conditions, the advantage of my combination is, that the oxidizable zinc being covered or shielded from the active agent of sea water, chlorine, which must first pass through the negative copper before the more positive metal is touched, oxidation can only take place in an infinitesimal degree. Or again, copper, which becomes positive in combination with the last covering, mercury, is shielded from the action of chlorine (which is the negative element in sea-water) as the chlorine at its entrance to attack the positive metal meets the mercury, which is also negative, and between them no at-

“ traction or affinities exist, thus rendering this amalga-alloy far  
“ superior in duration to copper or any other known compound  
“ metal.”

[Printed, 4*l*. No drawings.]

A.D. 1857, August 19.—N° 2198.

WALL, ARTHUR.—A material or materials for preserving the bottoms of iron ships or other vessels, and for the preservation of all iron surfaces submerged in sea water, or partially or occasionally so submerged. The first of the two mixtures applied to the surface to be protected is composed of oxide of lead, turpentine, colophine or resin, and naphtha; and the second of colophine or resin, oxide of mercury, and charcoal. This second coating will close, stop, or fill in any cracks or gaps left in the application of the first, to the bottoms of iron ships or other surfaces of iron to be submerged in sea water. The inventor also describes a mode of causing the deposition of metals held in solution, upon metallic surfaces, applicable to protecting the bottoms of iron ships.

[Printed, 4*l*. No drawings.]

A.D. 1857, August 19.—N° 2199.

DESSALES, ALEXIS JEAN.—(*Provisional protection only.*)—  
“ This invention consists in an mprovement in lamps for railway  
“ carriages, ship’s cabin, and other oil lamps, and the improve-  
“ ment consists in constructing the oil box on the principle of a  
“ syphon filled from the upper part, in which a twofold action  
“ is produced, inasmuch as the lower part is furnished or fitted  
“ with a valve, and is so arranged that when the slide with which  
“ the upper part is provided is removed, for the purpose of in-  
“ troducing the oil, the valve in the lower part closes immediately,  
“ thus preventing the flow of oil in the supply pipe until such  
“ time as the lamp is required to be lighted, when on closing the  
“ opening on the upper part with the slide, the valve in the  
“ lower part is immediately acted upon, allowing the oil to flow  
“ freely through the supply pipe to the burner.”

[Printed, 3*l*. No drawings.]

A.D. 1857, August 20.—N° 2215.

TAYLERSON, ROBERT.—(*Provisional protection only.*)—This invention has for its object “an improvement in metal ships and vessels, and consists in the employment of sheets of iron and ribs or frames of iron (in constructing the body or shell of a ship or vessel), which have been first coated with a metal or alloy as an intermediate coating, and then coated with copper or any alloy of copper, so as to produce such a degree of oxidation or decomposition of the copper as to prevent a ship or vessel so constructed becoming foul.”

[Printed, 3d. No drawings.]

A.D. 1857, August 21.—N° 2226.

CLARKE, HENRY.—(*Provisional protection only.*)—“Improvements in the lines of steam vessels and in the method of propelling the same.” The improvements in “the lines of steam ships, consist in forming vessels with such lines, that when propelled their tendency shall be to skim over the water rather than to displace and pass through the water as ordinary vessels do. To effect this I construct the vessel with a flat bottom throughout a considerable portion of its length, while the bows or fore part, as also the after part or run is a continuation of the same flat surface, but at such an angle of inclination, as is best adapted for meeting the obstruction of the water at the stern. The bow and stern I construct of the same breadth as the midship section, so that the whole breadth of the inclined fore part of the ship is presented to the water in passing through it, and in proportion to the speed generated so will it have a greater or less tendency to rise and pass over the surface. The breadth and incline of the run will support the stern of the vessel when so partially raised out of the water, and will at the same time possess great freedom in leaving the water: the incline of the stern I make of less length than that of the fore part of the ship. The sides of the ship may be carried up at right angles to the bottom, or inclined outwards a little, to break the water and prevent the shipping of a sea.” The improvement in propelling this construction of vessel, consists in the appli-

cation of the Archimedean screw supported above deck in the air, and rotating at a high velocity in the atmosphere.

[Printed, 3d. No drawings.]

A.D. 1857, August 24.—N° 2239.

HAMILTON, ALFRED.—“ This invention has for its object  
“ improvements in the construction of and in mooring buoys,  
“ beacons, floating lights, and other floating vessels and bodies.  
“ For these purposes, in constructing buoys, beacons, floating  
“ lights, and other floating vessels and bodies, they are made  
“ annular or of ring shape, that is, every such floating structure is  
“ made open in the centre (though it may have a platform or deck  
“ formed above such open space). It is preferred that the bottom  
“ of every such structure should be flat, and the outer side thereof  
“ formed as though the structure were composed of two equal  
“ and similarly truncated cones, the one inverted upon the other,  
“ so that their smaller ends should be in contact, the line of  
“ floatation coinciding with the line of contact of such cones, but  
“ neither of these conditions is essential. It is also preferred that  
“ the structure in every case should be circular or elliptic, but this  
“ is not essential; nor is it essential that the line of floatation  
“ should be at the smallest circumference, as, in place of forming  
“ a structure girt in or of least circumference in the middle, or at  
“ any other part than the middle of its depth from top to bottom,  
“ the sides may be made to bulge or project outwards. When  
“ constructing such floating bodies of iron, it is preferred to make  
“ them in sections, each capable of floating alone, the sections  
“ being fitted so that they, or any one or more of them may be ”  
readily removed and replaced by another or others respectively,  
“ and when of large diameter such structures may be made with  
“ openings, to allow of boats passing into and from the interior.  
“ In mooring such floating structures, the mooring chains or  
“ cables are made fast to the body on the inner side thereof, and  
“ at or near the centre of the open space. The apparatus for  
“ mooring consists of a structure composed of wood or iron, or  
“ a combination of wood and iron, or any other substances, or  
“ combination of substances, such that if unconstrained it would  
“ float on the surface of the water, to which structure an amount  
“ of chain or other cable or moorings is attached sufficient to  
“ cause it to sink below the surface to any required depth.” This

description of mooring buoy is also capable of affording to ships bringing up in deep water the advantages of a mooring in shallow water, whilst, being below the surface of the water, it offers no obstruction to the movements of shipping.

For the purpose of rendering the position of a buoy, beacon, floating light, or other floating vessel or body, when moored or at anchor, more secure in a heavy sea, the inventor has invented what he calls respectively "a self-acting brake," and "a self-acting screw or paddle." The self-acting brake consists of a structure of wood or iron, or other material, in the form of a shutter or door, so fitted as to retard the motion of the vessel when she is struck by a sea. "The self-acting screw or paddle consists of a screw or paddle wheel, fixed beneath or within the floating vessel or body, and partly or wholly submerged, so that when the floating vessel or body obtains backward motion as when it is struck by a sea on its fore part or bows), the screw or paddle wheel will be made to revolve by the pressure of the water. The screw or paddle wheel works on an axle, which is connected with springs or weights within the floating vessel or body in such wise that when it is made to revolve by pressure of the water, these springs or weights become tightened or compressed, or drawn up respectively, and remain so until the pressure exercised by the water has ceased, when the screw or paddle wheel is made to revolve again by the action of the springs or weights (but in an opposite direction), until the springs or weights have resumed their original state of tension or condition of rest, so that the floating vessel or body may by the second action of the screw or paddle be immediately brought back to its first position."

[Printed, 10d. Drawings.]

A.D. 1857, September 8.—N<sup>o</sup> 2338.

**MACKELCAN, GEORGE JOSIAH.**—"Improvements in floating docks." A floating dock or ship lift is so constructed that it may be sunk to the bottom of the water, or to any depth necessary to receive a ship, and may then be caused to float or rise, until the ship is lifted out of the water. It consists of a pontoon or vessel of iron framing, sheeted over entirely with plate iron, so as to form an air-tight and water-tight chamber; this chamber is divided into air and water-tight compartments, or it may consist of separate pontoons united together by a common deck or plat-

form. These chambers or pontoons, or any of them, being filled or partially filled with water or air at pleasure, will cause the dock to sink or float with any required degree of buoyancy. "Upon the deck of" the floating dock "I erect a row of tubes or hollow columns along each side, open to the chambers beneath, of a greater height than the draught of the ship to be docked, so that they are never entirely submerged; the upper ends of these tubes or columns carry a platform or path along each side of the dock & of its whole length; these platforms are" to serve as "a guide for getting a ship into position, when the pontoon is submerged," and also to "sustain temporary shores, until the deck or platform on which the ship rests, is above water; through these tubes or columns the chambers are filled with air & emptied of water." In a tideway the dock may be grounded, and the ship placed in position and shored; and when left by the receding tide, the water may be let out of the chambers by valves or scuttles; the dock will then, on the return of the tide, float with its burden. This dock or lift may be constructed without the upright tubes or floats, in which case some of the chambers will remain permanently filled with air, as a counterpoise to the specific gravity of the dock; and the others will be emptied of water, and filled with air by flexible tubes.

[Printed, 1s. 4d. Drawings.]

A.D. 1857, September 19.—N<sup>o</sup> 2437.

JAMES, WILLIAM HENRY.—"Certain improvements in steam vessels, parts of which improvements are applicable to sailing and other vessels." These improvements consist, firstly, "in forming the hulls of steam vessels of two or more long hollow cylinders composed of metal, wood, or a combination thereof, united together side by side, and strengthened internally by suitable stays of similar materials, and having transverse tubular passages extending from cylinder to cylinder above the lower points of junction, for enabling persons to pass freely from one to the other. The upper and lower interstices between these cylinders I form into numerous cells by means of transverse partitions, which I cover over with plates of metal or planks of wood, the upper portion of which will constitute the decks, and the lower portion the bottoms of such vessels, which bottoms may be made either flat, concave, convex, or corrugated,

“ as may be preferred, for giving additional strength and firmness  
 “ thereto, the ends of which cylinders may be made hemispherical  
 “ or of any other eligible shape, or may be united with or made  
 “ to terminate in very oblate semispheroidal chambers, which  
 “ would form suitable bows and sterns to such vessels when made  
 “ to correspond with their semicircular or semicylindrical sides.

“ Secondly, instead of forming the hulls of steam vessels of  
 “ perfect cylinders joined together as before described, I some-  
 “ times form such hulls of similar contour, without any material  
 “ diminution of strength, by covering externally with metallic  
 “ plates or planks of wood two or more cylindric frameworks of  
 “ similar materials joined together laterally, the upper portions of  
 “ such coverings constituting the decks, which may be made  
 “ double and cellular if preferred, and the lower portions the  
 “ bottoms of such steam vessels, which bottoms may be varied in  
 “ shape, and the framework strengthened by any number of beams  
 “ or rods in lieu of the cellular partitions, and the vessels so formed  
 “ may have their bows and sterns similarly constructed, and may  
 “ be advantageously divided into any desired number of water-  
 “ tight compartments, in the same manner as when perfect cylin-  
 “ ders are used, as before described.

“ Thirdly, in the employment of one or more pairs of paddle  
 “ wheels with enclosed sides, or with the sides of the paddles only  
 “ enclosed, for the propulsion of vessels constructed as before  
 “ described, which wheels may be formed with one or more divi-  
 “ sions, and the paddles so placed in each as to alternate with  
 “ those in the adjoining division or divisions, every pair of wheels,  
 “ or each wheel if preferred, being actuated by a separate engine.

“ Fourthly, in forming the hulls of common sailing or other  
 “ vessels in a similar manner as before proposed for steam  
 “ vessels.”

[Printed, 7d. Drawings.]

A.D. 1857, September 22.—N° 2458.

**RENNIE, GEORGE.**—“ Improvements in vessels for war and  
 “ revenue purposes.” These improvements consist,—

First, “ in the construction of iron vessels of small but sufficient  
 “ internal depth, with a flat floor, and full round bottom sides,  
 “ and proportionately wide beam, so as to combine for a given  
 “ length small draft with stability, and power of resisting without

“ injury shocks produced by the discharge of ordnance carried on  
“ the deck of or within such vessels, their length being divided  
“ in three parts ; one portion having a strong deck for carrying on  
“ a suitable kerb or rails the traversing platform of a central ro-  
“ tating pivot or other gun, howitzer, or mortar, suitably mounted,  
“ such deck being supported upon transverse and longitudinal  
“ bulk heads, forming cellular compartments available for storing  
“ provisions, water, &c. ; as also for the powder magazine, and  
“ stores of shot, shells, rockets, &c. ; another portion of the length  
“ being appropriated to the engines, machinery, boilers, and coal  
“ bunkers ; whilst the remaining part or portion of the length is  
“ devoted to the accommodation of the officers and the crew, who  
“ are protected by a suitable covering and enclosure, raised to a  
“ sufficient height above the top strake or bulwark.

“ Secondly, in the disposition of the propelling apparatus in a  
“ vessel constructed according to this invention, by employing,  
“ alone or in conjunction with any other propelling apparatus,  
“ two screws disposed one on each side of the stern.”

Thirdly, in the combination or disposition of the engines for  
working such propelling apparatus, by placing the steam cylinder  
or cylinders of one engine in advance longitudinally of the  
cylinder or cylinders of the other engine, and on the opposite side  
of the keel line.

Fourthly, in the disposition of the coal bunkers, and of the  
boilers for such vessels, the coal bunkers being formed on each  
side of the boiler and engine space, and partially projecting there-  
over as a protection thereto.

Arrangements are made for firing the bow gun at a considerable  
depression.

[Printed, 7d. Drawings.]

A.D. 1857, October 1.—N° 2519.

WARD, JAMES.—“ Improvements in pumps applicable for mines,  
“ ships, and other purposes.” The apparatus suitable for ship  
purposes is contrived “ so as to pump or suck water with each  
“ forward or backward stroke of the piston, and at the same time  
“ without deranging any of its working parts, with the exception  
“ of the alteration of a slide valve, to change the character of  
“ the pump and convert it into an engine for throwing water with  
“ a strong force for extinguishing fires, washing of decks, and  
“ other purposes” for which it may be required.

The pump consists of a horizontal cylinder and a valve box lying one above the other. The valve box is divided into three compartments by two vertical transverse partitions, and the central division is again divided into two parts by a horizontal partition. Each of these central divisions communicates with the end divisions (and through them with the extremities of the cylinder), by means of a valve at each end; the upper ones opening inwards and the lower ones outwards. All these valves are readily accessible by removing the covers on the ends of the valve box. The suction pipe leads into the lower central compartment, and the delivery pipe from the upper one. As the piston moves to and fro in the cylinder or barrel, the water passes out of one end of the lower central compartment, through the adjacent end compartment and into the cylinder, whence it is forced at the return stroke into the upper central chamber and into the delivery pipe. Thus it is evident that a continuous flow of water may be kept up by the simple action of the piston moving backwards and forwards in the cylinder, from which "all air is excluded, as its  
" existence there would only tend to diminish the working  
" capacity of the cylinder, and the pressure of the atmosphere  
" acting only on the ingress or suction pipe, the whole arrange-  
" ment may be said to be a mechanical syphon, the mechanism  
" employed being only required to lift the water in the suction  
" pipe a little above the mouth of the delivery pipe, which, for  
" the purpose of diminishing the amount of power required,  
" should be conducted down near to the water mark or sur-  
" face of the sea; the difference between that and the surface  
" of the water in the hold of the ship gives the weight of water  
" lifted (and the consequent amount of power required), as all  
" beyond flows on the principle of the syphon; thus I appropriate  
" to its greatest extent the natural pressure of the atmosphere to  
" the diminution of power that otherwise would be required."

In order to convert the pump into a fire engine, a vertical slide valve is pushed down to cut off the ordinary communication between the suction and delivery pipes and the valve box, and to open a communication between the lower part of the valve box and the delivery pipe, which then becomes a supply pipe from the sea. A hose is screwed on at a nozzle communicating with the upper part of the valve box. An air box is also provided.

[Printed, 1s. 5d. Drawings.]

A.D. 1857, October 8.—N° 2582.

**FOSTER, ELBRIDGE.** — (*Provisional protection only.*) — This invention consists “in a movable and adjustable berth” for navigable vessels, “provided with one or more hinged or attached flaps or keels and folding inflatable air chambers, whereby the same may be used as a life preserver.”

[Printed, 5*l.* Drawings.]

A.D. 1857, October 15.—N° 2640.

**HOPPER, WILLIAM BROWN.** — (*Provisional protection only.*) “Improvements in floating docks.” The improved floating dock “consists of a platform for receiving the ship, and having under it air vessels of sufficient capacity to support the platform with the ship upon it above the water level. At intervals along the two sides of the platform are formed other air vessels projecting upwards above the surface of the platform to a height greater than the draft of the largest ship which the dock is constructed to receive. When the dock is to receive a ship, water is admitted to the air vessels under the platform, which causes it to sink for some distance, but the dock is still kept floating by the side air vessels, and the depth to which the platform sinks can be regulated by admitting more or less water to these side air vessels. When the platform has descended to the necessary depth the ship is floated over it and shored in the usual way, then by means of pumps the water is discharged from the air vessels under the platform, and thus the ship is raised out of the water.” “To facilitate the repair of docks of this description I so construct them that they can be divided from end to end longitudinally, and then each of the sections can be floated into a dock of similar construction and repaired thereon.”

[Printed, 3*l.* No drawings.]

A.D. 1857, October 26.—N° 2713.

**CLIPPÈLE, CHARLES DE.** — A composition which, among several uses, is applicable to barques, boats, and other vessels, and may be applied “externally and internally for rendering them impervious to water, for protecting them from shells and insects, and from

"humidity." The composition or cement consists of sulphuret of carbon about one pint and three quarters, and gutta-percha about nine ounces and a half.

[Printed, 4d. No drawings.]

A.D. 1857, October 21.—N<sup>o</sup> 2689.

DUKE, ROBERT.—"Improvements in the means of communicating power to ships' pumps" The improvements consist "in the application of an oscillating weight by which the application of manual labour to working ships' pumps is materially assisted. The pumps are mounted in pairs in the usual manner, and worked from a double arm or lever mounted on an oscillating shaft, the pump rods being attached one at either end of such lever. This shaft is mounted some feet from the deck, on it I fix and suspend a lever weighted at the bottom like a pendulum. Ropes are attached to this weight or lever, and an oscillating motion communicated thereto by 'hands,' alternately pulling in opposite directions, or it may be pulled and let go alternately in one direction only."

[Printed, 6d. Drawings.]

A.D. 1857, October 31.—N<sup>o</sup> 2765.

GALLOWAY, GEORGE BELL.—"Improvements in the construction of merchant ships and other vessels, in motive powers, propulsion, and boiler furnaces." "The vessels are constructed with a series of flat hollow pipes or channels between the bulwark and the bends of the vessel, of such form as may be adapted to the build of the vessel, such pipes or channel being larger on the section near the bulwarks, and smaller in proportion as required. Cork (or other suitable air and water tight substances) is inserted in these tubes, by and through which the fastening to the vessel's timbers and planking is effected. When required, I also insert tubes between the timbers and under the water line of the vessel, and also underneath or at the bottom, the object being to produce buoyancy and speed, together with the means of preserving life in case of disasters, shipwreck, &c. In order to produce much greater speed and buoyancy, I arrange and affix the pipes or channels at the bottom parts in the construction of new vessels. The tubes or

“ channels above referred to may be filled with atmospheric air,  
“ and are made of any suitable material, and of such proportions  
“ and length to suit the vessel’s planking, &c. The tubes  
“ intended for the bottom parts and bows of vessels have a wedge  
“ end or entrance to suit such positions. The bolts may have  
“ what is termed a T-head, or the tubes may be secured or  
“ fastened by iron bands and usual ship’s fastenings. The tubes  
“ or channels have cork or other suitable substance inserted at  
“ suitable distances (in the cross section) to allow for fastenings,  
“ as well as at each end to allow for the like purposes. In small  
“ vessels or boats, instead of having the air-tight compartments  
“ inside or underneath the seats, as is now the general practice, I  
“ affix around the top sides above the water line air-tight tubes  
“ or channels, made especially light for such purposes; and as a  
“ means of lowering said vessels when required, at sea or else-  
“ where in cases of emergency, I affix a sling with a leading  
“ block or thimble in the centre. Such sling is attached to each  
“ side, both fore and aft of the boat or vessel. A rope fastened  
“ to a cleat or pin passes through the leading blocks, which are  
“ secured to the bottom of the boat, and also affixed to the ring  
“ bolts fore and aft,” and “is the means by which the vessels are  
“ suspended and lowered, the object being to enable the parties  
“ whose lives depend upon such means of preservation to get into  
“ the boats, and with their supply of provisions, &c., to be safely  
“ suspended and lowered from the vessels. The air appliances  
“ before referred to may be of vulcanized india-rubber or other  
“ suitable tubing, and formed to an oval or other shape, and  
“ secured to the boat or vessel by a rope lashing, or covered with  
“ canvass or other substance which can be secured to the sides  
“ and gunwale of the boat. I also apply another tube within the  
“ boat; this I affix at one side across or under the seats fore and  
“ aft. The object of this tube is to remedy accidents which  
“ sometimes occur by boats upsetting, as it will prevent the boat  
“ or vessel to which it is applied,” “remaining what is termed  
“ bottom-up; and as a means to prevent such vessels from  
“ sinking, in case of being what is termed stove or strained, and  
“ thereby very leaky, I affix one or more of these tubes con-  
“ veniently secured below the bottom boards or underneath the  
“ floor of the boat. The tubes I prefer to be filled with gas, but  
“ they will answer filled with atmospheric air. The description of

“ block or brake pulley referred to is of the following construction,  
 “ that is to say; two pulleys are affixed in a groove or hollow  
 “ channel, and a piece of wood is affixed between them, which acts  
 “ as a brake. The men have by this appliance complete control  
 “ over the boat in lowering, and as soon as the boat reaches the  
 “ water the men attending upon the lowering ropes have simply  
 “ to let go the ropes, and the boat is then free and clear of the  
 “ ship. This break, block, or pulley is placed at each end of  
 “ the boat or vessel, and to add strength to the boat's framing,”  
 the blocks “ or pulleys, after being secured to the bottom of the  
 “ boat by bolts, have an iron hoop or band also passing to each  
 “ side of the boat, which is affixed to the planking, &c. I also  
 “ purpose applying the break, block, and pulley before described  
 “ for other purposes. Or as a means of lowering ordinary ships’  
 “ boats, I affix a roller at each end of the boat under the seat or  
 “ thwart. The lowering rope, after passing through a block  
 “ which is attached to the ring bolts fore and aft, is passed round  
 “ the roller, say, twice, which gives full power and command  
 “ to the men in the boat, as by easing away the lowering rope  
 “ they can lower themselves with the boat, and let go as and  
 “ when they please. This plan also obviates the necessity of  
 “ any hooking tackles,” whereby serious accidents oft-times occur.

It is proposed to apply “ the expulsion of air or water, separately  
 “ or conjoined, as a motive ” or auxiliary power to merchant  
 ships and steamers for propulsion, for the purpose of steering and  
 assisting the vessel round, and for reversing the progress of the  
 ship or vessel without stoppage of the engines. The air or water  
 exit pipes are to be affixed near to or within the stern parts of the  
 vessel and the valves or covers to them are moved by an iron bolt  
 or rod, communicating with the vessel's deck, which rod and  
 appliance upon the deck resembles the ordinary ship's helm or  
 tiller, and can be moved as or with the helm of the ship.

[Printed, 8d. Drawings.]

A.D. 1857, October 31.—N<sup>o</sup> 2771.

**BROOMAN, RICHARD ARCHIBALD,** — (*a communication.  
 Provisional protection only.*)—This invention consists “ in the  
 “ construction of folding or collapsible boats which can be readily  
 “ expanded, and which, when folded, can be easily stowed, as, for  
 ‘ instance, on ships’ decks, and occupy but little space.”

The keel is formed of iron in two or more parts capable of sliding over each other, to allow of the keel elongating or contracting, as the boat is required to be expanded or collapsed. The ribs are of iron, and are all pivotted on the keel; the side plates are also of iron, united and made tight by an outer skin or casing of caoutchouc cloth; the side plates are bolted to the stem and stern, which are continuations of the keel bent up into the proper shape. "The caoutchouc cloth is secured at bottom to each side  
 " of the keel, by being interposed between it and an outer plate  
 " of metal on each side, held by bolts and rivets, and at top to  
 " the gunwale by being interposed between the side plates and an  
 " outer plate secured by bolts and rivets. The seats form stretch-  
 " ers, and are secured at one end to the top of the ribs; they  
 " follow the motion of the ribs, and are connected to the oppo-  
 " site side thereof when the boat is expanded, by spring catch or  
 " other suitable joints, and prevent the pressure of the water from  
 " forcing in the sides."

[Printed, 3d. No drawings.]

A.D. 1857, November 6.—N° 2820.

**MACNAB, WILLIAM.**—This invention has for its object "im-  
 " provements in vessels propelled by screw or other similar pro-  
 " pellers, so as to render such vessels more suitable for use in  
 " shallow water. For this purpose the vessel is fitted to receive  
 " two propellers, mounted on two shafts laid parallel to each  
 " other, and these propellers may be of such a size as either to be  
 " totally submerged or only partially so, as may be preferred. In  
 " order to adapt the vessel to receive these propellers in such a  
 " way that they may be protected from injury from floating bodies  
 " or otherwise, it is constructed with two stern posts, and it is  
 " between these two stern posts that the propellers are placed.

"In order that the water may not be obstructed in its passage  
 " to the propellers, the vessel is arranged so as to draw less water  
 " at the stern than elsewhere; but the stern posts descend to the  
 " full draft of the vessel, in order that the rudders (of which  
 " there are two, one on each stern post) may have sufficient  
 " power.

"In constructing large vessels, but which are to have a small  
 " draft of water, I sometimes form them with three stern posts,

" one at the centre line of the vessel, and another on each side of  
 " this central post; in this case I may employ four propellers,  
 " two in each of the openings between the stern posts."

[Printed, 2d. Drawings.]

A.D. 1857, November 19.—N<sup>o</sup> 2904.

**CLAY, WILLIAM.**—This invention consists in making " metal  
 " knees employed in the construction of ships, buildings, railway  
 " or other waggons or carriages, or other analogous purposes of  
 " steel or a combination of steel and iron," by the use of ma-  
 " chinery for rolling the metal of a taper form.

[Printed, 3d. No drawings.]

A.D. 1857, December 2.—N<sup>o</sup> 2995.

**FRANCIS, JOSEPH, and MANBY, CHARLES.**—This invention  
 has for its object " improvements in the manufacture of wagons  
 " and other vehicles applicable to the transport of troops and  
 " military and other stores on land and water. For these pur-  
 " poses the bodies of carriages are made of corrugated sheet  
 " metal or of sheets of metal, which are made with longitudinal  
 " or other depressions or cavities on one side, and consequent  
 " projections or convexities on the other side, such projections or  
 " convexities not proceeding to the edges of such sheets when  
 " using corrugated sheet metal; where the corrugations proceed  
 " to the edges, then in joining the ends and forming the angles  
 " of the body of a wagon or other carriage," " corrugated or  
 " undulating angle iron is used, by which better rivetted joints  
 " can be produced, and the joints more readily rendered water-  
 " tight. In some cases, in place of allowing the corrugations to  
 " proceed to the edges, the sheets where they come to the angles  
 " are rendered flat or free from corrugations, and in that form  
 " they are rivetted together. The fore part of each body of a  
 " carriage is made of a shape suitable to facilitate its passage  
 " through the water, and this part is enclosed and made air-tight,  
 " so as to be buoyant; hence, when the bodies of two wagons or  
 " carriages are fixed together back to back or end to end there  
 " will be a buoyant chamber at each end, which will be of im-  
 " portance when the bodies of carriages are being used as boats  
 " or floating vessels; and in addition to the buoyancy obtained  
 " as above, the bottoms of the bodies of wagons or carriages

“ which are made of corrugated or indented iron are covered or  
 “ inclosed water-tight, so that the hollow enclosed spaces will add  
 “ to the buoyancy of the whole. The upper edges of the bodies  
 “ of wagons or other carriages are made with capping, which fits  
 “ on to and is rivetted to the edges, or the same are strengthened  
 “ by angle iron. At the upper edges of the bodies of such wagons  
 “ or carriages rowlocks are applied; and provision is made for  
 “ carrying oars, so that they may be in a convenient position for  
 “ being brought into use. The framework or bed is constructed  
 “ of angle iron, or ribbed iron, with braces and cross pieces to  
 “ give strength and lightness. The running gear is attached to  
 “ the framework by jaws and catches or screws in such manner  
 “ as to admit of the same being detached and re-attached with  
 “ facility.”

[Printed, 10d. Drawings.]

A.D. 1857, December 2.—N<sup>o</sup> 2996.

PARKES, ALEXANDER, and PARKES, HENRY.—This invention has for its object improvements in the manufacture of sheathing metals. For these purposes copper, and copper and its alloys with zinc, are combined with such a quantity of phosphorus, or with the metal manganese, or with mercury, as will admit of the metals being rolled hot into sheets. The inventors state that copper, and copper and its alloys with zinc, have before been combined with phosphorus and manganese, but in such proportions as will not roll, or not advantageously roll hot into sheets at a red heat.

[Printed, 4d. No drawings.]

A.D. 1857, December 3.—N<sup>o</sup> 2999.

BOUSFIELD, GEORGE TOMLINSON, — (*a communication*).—  
 “ Improvements in collapsible boats.” “ In order to construct a  
 “ boat according to the principles of the invention, I construct a  
 “ model or lay down the lines of boats, having this peculiarity of  
 “ shape, videlicet, that, in a boat built in accordance with such  
 “ lines or model, there shall be at least four straight lines in her  
 “ outer surface or contour, each of which departs from a point at  
 “ or near the meeting of the stem and stern pieces with the keel,  
 “ and thence rises diagonally upwards, and towards the centre or

“ midship section of the boat until it reaches nearly to the gun-  
 “ wale.” “The upper terminations of these lines are to be united  
 “ on each side of the boat by other lines running parallel to the  
 “ gunwale or nearly so, or to the keel, and from the points of  
 “ junction of these lines other lines are to be drawn vertically  
 “ upwards or nearly so, till they reach the gunwale. After a  
 “ model or lines in which to build a boat is made in accordance  
 “ with these directions, and having such lines laid down thereon,  
 “ a boat in sections is to be built in accordance with the model,  
 “ there being by preference at least eight sections bounded by  
 “ the lines above described, and by the gunwale,” “ stem, stern,  
 “ and keel. These sections are then to be attached to each other,  
 “ and to the stem, stern post, and keel by proper hinges, and when  
 “ thus attached will constitute a boat capable of being expanded  
 “ so as to have the shape and appearance of an ordinary boat,  
 “ or of being shut up so as to occupy a comparatively small  
 “ space.”

[Printed, 7d. Drawings.

A.D. 1857, December 11.—N° 3060.

**ROBERTS, JULIUS, and BEALE, MILKS.**—This invention relates to “the application of a weighted rod which is capable of  
 “ receiving a vibrating or a rotary motion to the driving of  
 “ machinery. We propose chiefly to apply our invention to the  
 “ actuating of ships’ pumps, capstans, and other uses on ship-  
 “ board, as we are then enabled to avail ourselves of the rolling  
 “ motion of the vessel for setting the weighted rod in motion.  
 “ When adapting the invention in the simplest form to produce  
 “ a reciprocating motion suitable for working a pair of pump  
 “ pistons, we suspend a pendulum rod carrying any given weight  
 “ from the rock shaft of a cross beam, and connect the opposite  
 “ ends of this beam by means of pendent rods to the pistons of  
 “ the pump cylinders. As, therefore, the vessel rolls the pen-  
 “ dulum will be caused to oscillate (it being guided in its course  
 “ by antifriction rollers running upon guide rails) and set in  
 “ motion the cross beam, the vibrating action of which will raise  
 “ and depress the pistons alternately; or instead of attaching the  
 “ pendulum directly to the rock shaft it may have a separate  
 “ centre of motion and drive the beam through the medium of  
 “ sector racks. For obtaining a rotary action from the vibrating

“ pendulum, we propose to continue the pendulum rod beyond  
“ its centre of motion, and to connect it to a rocking lever by  
“ gearing or otherwise. To the opposite arms of this lever we  
“ attach pawls which take into the teeth of a ratchet wheel, and  
“ by their alternate action impart a continuous rotary motion to  
“ the shaft of that wheel, which motion may be communicated  
“ directly or by gearing to a capstan or windlass barrel, or other  
“ mechanism required to be driven. When we desire that the  
“ weighted rod shall receive and impart a rotary motion, we mount  
“ it in gimbals or suspend it in a ball-and-socket joint, and cause  
“ it when acted upon by the rolling of the vessel to travel in a  
“ circuit by means of a circular guide and check rod, or other  
“ suitable arrangement. Then by connecting the upper end of  
“ the rod to a crank, or its equivalent, rotatory motion available for  
“ a variety of uses may be derived therefrom. The vibrating  
“ pendulum during calm weather may be worked by one or more  
“ lanyards attached to its weighted end; or it may be beneficially  
“ used as a maintaining power by attaching it, for example, to  
“ pumps worked by the ordinary vibrating handles.”

[Printed, 10d. Drawings.]

A.D. 1857, December 21.—N° 3128.

HAMILTON, JAMES.—(*Provisional protection only.*)—“ This  
“ invention relates mainly to an improved manner of constructing  
“ the keel, keelsons, and lower portions of a vessel by so ar-  
“ ranging the timber and bolts used to connect the various parts  
“ that a much greater amount of strength may be obtained than  
“ by the method now in use, and that is accomplished without  
“ the use of timber of the large dimensions now required for the  
“ purpose; and in making a provision against the dry rot in  
“ vessels by forming shallow channels or grooves in the surface  
“ of the timber in the direction of the grain of the wood, on all  
“ or a portion of the surfaces of the timbers, planking, and  
“ ceiling which are in contact; by which arrangement air cells  
“ or passages are formed throughout the whole structure,  
“ through which air, gasses, or fluids may be forced if it should  
“ be deemed advisable.” The keel, except the foremost and after  
pieces, is to be formed with a vertical joint down the middle;  
there will thus be, as it were, two keels in the central portion of  
the ship, the several lengths of each being scarphed with side

scarpha, properly "shifted" with regard to each other. There are to be a lower and an upper keelson, the lower one made like the keel in two parts. "By this arrangement two bolts can be passed through each floor timber and right down throughout the keel, in place of one now used. On the top of the lower keelson a stout log or logs are laid (singly), which covers by centreing the joints of the lower keelson, and sufficiently large to allow of bolts being driven diagonally through it and the lower keelson; each alternate bolt being so driven that they are crossed or reversed to each other, and these crossing, or diagonal bolts are so introduced that they pass through the lower keelson clear of the floorings, and are there riveted; or these bolts may be so formed with screwed points to receive a nut, if preferred. The whole is then covered on the top with a chafing or hog piece. In addition to the lower limber passages now used, upper limber passages for the water to the pump well are formed over the flooring seats on each side of the keelson. These upper limber passages are covered by loose planks or timber covers which fit into rabbets formed into the timber foot logs, with an extra piece of thick stuff entering the two lower ones on the surface, and bolted diagonally on the lower pieces for further strength. It is preferred to fit the limber covers so that they will slope upwards from the timber foot logs and rest against the sides of the lower keelson."

[Printed, 3d. No drawings.]

A.D. 1857, December 23.—N<sup>o</sup> 3149.

**NIXON, CHRISTOPHER NUGENT.**—"This invention consists of certain improved modes of attaching, fitting, and securing the rudders of ships, barges, boats, and other vessels, by means of which such rudders can be more readily shipped and unshipped, when necessary, and also rise of themselves on coming in contact with any obstacle upon which they may accidentally strike or ground, and again return to their proper position after passing such obstacle, and so that such motion of the rudder shall not affect, impede, or interfere with the action of the tiller, yoke, wheel ropes or chains, or other steering gear." The modes of attaching the rudder involve the use of gudgeons and pintles, of various novel shapes, according as they are intended for boats or ships, or for square or round-headed rudders. In most cases the

eye of the gudgeon is slit or slotted down the front, and the pintles are long bolts entered into these gudgeons in various ways.

Another part of this invention consists of a method of securing the tiller or yoke from being interfered with by the rising of the rudder when thus fitted. "With this view the tiller or yoke should be so secured as to embrace the rudder head without being fixed thereto."

[Printed, 1s. Drawings.]

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1858.

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A.D. 1858, January 7.—N<sup>o</sup> 27.

REILLY, JAMES, Junr.—Improvements in chairs and seats of various descriptions; among others, in chairs and seats for railway or road carriages, cabs, steam vessels, &c. To the frame or body of the chair or seat is attached a cylinder or guide, the interior of which is fitted with a rod or piston, having a spring or springs in connection with it, so arranged as to give elasticity to the seat which is connected to the rod or piston, affording at the same time the means of giving a swivel or rotary motion. The elasticity may be given to any extent, according to the length and strength of the springs; and by placing the cylinder on a ball or universal joint, any description of see-saw or oscillating movements may be obtained; or, instead of placing the cylinder on the body or frame of the chair or seat, it may be attached to the seat, and the rod or piston connected to the framing. The improved chair or seat may be made with the ordinary legs, or they may be dispensed with as desired, and the lower part of the frame furnished with rockers, or made partly spherical.

[Printed, &c. Drawings.]

A.D. 1858, January 20.—N<sup>o</sup> 95.

MARTIN, ROBERT.—The invention relates to an arrangement of machinery or apparatus, whereby coal and other minerals can be shipped or transferred from the shore or pier head, into the holds

of vessels lying in tidal ways, "In shipping coal by the agency  
 "of this machinery the railway waggons are run up at right  
 "angles to the pier head or wall until they come upon a  
 "balanced tipping arrangement. This arrangement consists of  
 "a frame set on suitable centres, and fitted with counterweights  
 "and frictional brakes, so that when the waggon is run on to  
 "the frame up to the outer curved stops of the rails the coal is  
 "tipped out at once, the rate of descent being governed by the  
 "frictional brakes. As the coal falls from the waggon it de-  
 "scends upon the upper and landward end of an articulated  
 "shoot," "which is so inclined as to direct the coal down into  
 "the hatchway or hold of the vessel in the tidal way beneath.  
 "This shoot is of considerable length, and is in several pieces  
 "articulated or jointed together, and capable of being wound  
 "upon a square barrel or carrier, the shaft of which is set in end  
 "bearings in the pier head. The extreme inner or landward end  
 "of this shoot is fastened to the square barrel, each face of  
 "which is of the proper length for taking up the individual  
 "jointed lengths of the shoot, and suitable catches are provided  
 "for retaining the lengths in position as wound up. The barrel  
 "is actuated by winch handle or other gearing, and its shaft  
 "carries at each end a chain barrel or pulley, to which are attached  
 "supporting chains passed up and round overhead pulleys carried  
 "on suitable framing posts, and thence down for attachment to  
 "the extreme outer end of the shoot. In this way, by turning  
 "the barrel in either direction, the shoot is wound up or let  
 "down to suit the level of the water in the tidal way, and the  
 "apparatus is available for service in all states of the tide."

[Printed, 10d. Drawings.]

A.D. 1858, February 1.—N<sup>o</sup> 186.

"HAY, WILLIAM JOHN.—"An improved composition suitable  
 "for covering the caulking of ships and other like purposes, for  
 "uniting wood and other substances, for filling up seams, and  
 "for use as a waterproof composition generally." The "im-  
 "proved composition is intended to be run in over the caulking  
 "in the decks of ships, and to be paid by brush or otherwise  
 "over the caulking in the sides of ships and vessels, to be run  
 "in and fill up the seams in wooden and other structures; also

“ to be used as a glue to unite pieces of wood,” “ as a waterproof  
“ composition for roofs, floors, iron ships, and other iron work,  
“ &c.” The composition is formed of the following ingredients :  
asphalte or Trinidad pitch, vegetable tar, and oil naphtha, with  
or without the addition of caoutchouc. Or, instead of naphtha,  
rough creosote, spirit of turpentine, or any other spirit or essential  
oil, may be used ; or two or more of these ingredients may be  
combined, and mixed with asphalte or Trinidad pitch, and vegetable tar.

[Printed, 3d. No drawings.]

A.D. 1858, February 4.—N° 206.

BEALE, BENJAMIN.—(*Provisional protection only.*)—“ Improve-  
“ ments in apparatus for paying out and drawing in electric  
“ telegraph cables, applicable also to the raising and lowering of  
“ weights,” and more particularly ships’ cables and anchors. The  
invention consists “ in the combination of a drum with a  
“ cylinder and piston, with connecting rod and the usual valves  
“ used in steam engine cylinders.” The drum may be used as  
the paying-out agent, or it may be applied and act by friction  
upon one or between two other paying-out drums. When paying-  
out, the apparatus works simply as a break, but when desired to  
draw in or draw back the cable, it then acts as a motive-power  
engine, and, by the introduction of steam, works in the reverse  
direction to that it travelled in when driven by the friction of the  
cable.

[Printed, 3d. No drawings.]

A.D. 1858, February 6.—N° 224.

WHITE, WILLIAM, and PARLBY, JOSIAH.—“ Hitherto, in the  
“ preparation or treatment of carton pierre, papier mâché, and  
“ such like plastic substances, of which whiting or substances  
“ having the characteristics of whiting, combined with animal or  
“ vegetable gelatine forms the basis in obtaining various forms  
“ from moulds, it has been usual to obtain such forms in single  
“ colors only, to be afterwards painted, gilt, or otherwise coated.  
“ Now, one part of our improvements consists in producing  
“ direct from moulds forms of such materials for various pur-  
“ poses in two or more colors.” The improvements relate also to

the treatment of such carton pierre, papier mâché, and such like matters, to produce inlaying or imitation of inlays.

Blocks or sheets of such material, treated according to this invention, are adapted to cover or form sides and ceilings of berths, cabins, and other parts of ships, and in various forms to ship decoration.

[Printed, 4d. No drawings.]

A.D. 1858, February 16.—N<sup>o</sup> 298.

COUTTS, JOHN.—*Provisional protection only.*—The invention consists in a paint, pigment, or composition, more particularly adapted for coating the hulls of ships, either iron or wooden; and in apparatus for drying or warming substances by means of heated air, “whereby I am enabled advantageously to apply the  
“ said paint, pigment, or composition, which is composed of  
“ poisonous substances warmed by part of the said apparatus,  
“ and applied to the dried or heated surface as a protection of  
“ the materials composing the same from decay or fouling.”  
“ The pigment is formed of the following substances, and in  
“ something like the annexed proportions, but these are varied in  
“ the details for coating the different substances, even when  
“ various coatings are applied to the same material:—

“ All in fine “ powder.	Carbonate of baryta, about	-	-	·650
	Litharge or litharge	“	-	·065
	Arsenious acid	“	-	·030
	Asphaltum	“	-	·050
	Oxide of calcium	“	-	·030
	Creosote (oil of tar)	“	-	·175

“ These proportions are varied to meet different requirements;  
“ some are abstracted at times altogether and others substituted,  
“ or in conjunction with them, such as bichloride of mercury,  
“ silicic acid with caustic alkali, red oxide of antimony, gutta  
“ percha with benzole, camphine, or spirits of turpentine as sol-  
“ vents.”

The apparatus consists of a furnace, having a blast fan and flexible pipe attached to it, for directing a stream of heated air upon the surface requiring to be dried or warmed.

[Printed, 6d. Drawings.]

A.D. 1858, February 19.—N° 316.

RILEY, WILLIAM.—“An improved method of raising and lifting water from the bilge or holds of ships and other vessels, and in a peculiar construction and arrangement for effecting the same.” According to this method, “I construct one or more water-tight compartments, near the bulkheads, of a suitable width; these contain a number of inclined planes in a zig-zag position, in each of which I place a valve (opening upwards only) so that any water flowing into or upon the spaces so formed by the motion or rolling of the ship cannot return, but will by each successive heave or roll be elevated in proportion, until finally it will flow overboard at any desired point. By this arrangement also I am enabled, in case of only one water-tight compartment of a ship filling, to cause the water to flow to any part of the vessel where the pumps may be situated without opening any other direct communication. In case of a calm, or other circumstances where the vessel has little or no motion, the apparatus being suspended on an axis may be disconnected and allowed to oscillate; I then by means of a lever and gearing work it by hand, or by steam power when it is available, and by another arrangement I work it by the back water of the paddles in a steam vessel, or the headway the ship is making under sail. This system of lifting water may be applied either athwartships or lengthwise, as may be found most desirable. I also apply indicators or tell-tales, consisting of a ball floating in a chamber, and acting upon an index which may be placed in any conspicuous place on board, so as to be seen by the officers of the ship, which will register the depth of water in the hold.”

[Printed, 10d. Drawings.]

A.D. 1858, February 20.—N° 339.

CATLIN, GEORGE.—(*Provisional protection only.*)—“The improvements in the mode of constructing and propelling ocean and other steamers (from which I denominate them ‘grooved and submotive,’)” consist in “a groove which I propose in the hull of the vessel, passing under its centre from the bow to the stern, and into which groove and through the after part of it, a

“ strap with paddles or buckets is delivered through the hull of  
 “ the vessel by an upright wheel acting above and near the centre  
 “ of the deck, the said strap and paddles or buckets being lifted  
 “ by another wheel at the stern, thereby getting the full and  
 “ steady power of the engine to act upon the solid and unbroken  
 “ water by the buckets passing through the groove entirely below  
 “ the water line.” The hulls of such vessels are “to be con-  
 “ structed solid, with timbers or of iron, and ” cellular “ or hollow,  
 “ as the case may be, with the view to the increasing of speed  
 “ and lessening the dangers to property and life.”

[Printed, 3d. No drawings.]

A.D. 1858, February 24.—N° 369.

**BROWNING, HENRY.**—(*Provisional protection only.*)—“ This  
 “ invention has for its object an improved composition for cover-  
 “ ing iron and other ships’ bottoms and other surfaces. The  
 “ composition consists of verdigrease ground in turpentine,  
 “ thinned with damma varnish, white copal, or what is called  
 “ paper varnish. The composition is used as an ordinary paint,  
 “ or is laid on as a thick paste. The composition may be stained  
 “ or colored by ordinary materials used for paints.”

[Printed, 3d. No drawings.]

A.D. 1858, February 27.—N° 386.

**DESSALES, ALEXIS JEAN.**—“ Improvements in oil lamps for  
 “ railway carriages, ships’ cabins, and other purposes.” These  
 improvements consist, firstly, in the application externally of a  
 lever on the arm of the oil passage, for the purpose of working a  
 valve plate in the interior of the supply pipe, in such a manner as  
 either to allow the oil to flow freely to the burner, or to cut off  
 the supply altogether.

And, secondly, in the application of a leather packed slide, for  
 closing hermetically the orifice by which oil is introduced to the  
 oil box.

[Printed, 2d. Drawings.]

A.D. 1858, March 3.—N° 416.

**SLEEBOOM, WILLEM HENDERK’S.**—“ Improvements in the  
 “ construction of the keel of ships or other vessels.” The im-

provements consist in securing against each side of the keel a triangular batten or "adjutant keel," or in otherwise forming the keel, so as to make its section a six-sided instead of a four-sided figure. It is believed that by this means an obstacle will be presented to the passage of water under the keel, when the ship is inclined, and is making leeway; and that the leeway will be thereby diminished. It is also expected that the ship will steer better.

The upper part of the "adjutant keel" is to incline from the side of the true keel at an angle of twenty degrees, and the lower part at an angle of fifty degrees. The upper edges of the battens are to be fixed as near the garboard strake, as will permit their lower edges to cover a part of the ship's false keel, a row of nails or bolts being passed through the lower part of the "adjutant keel," into the false keel, by which means the latter will be strengthened and supported.

[Printed, 10d. Drawings.]

A.D. 1858, March 4.—N<sup>o</sup> 435.

**COWPER, THOMAS.**—(*Provisional protection only.*)—This invention relates to methods of checking the movement in the mass of bilge water which may have collected in the bottom of a ship, and which by the motion of the ship in a rough sea, causes the vessel to strain or labour and roll heavily. For this purpose "I dispose a series of dashboards" on each side of the keel, between low transverse bulkheads; "these dashboards are set at a suitable angle with the bulkheads, and form wedge-like spaces, into which the bilge water upon the rolling and pitching of the ship is driven, then, by providing suitable perforations in and through the bulkheads, the bilge water will be driven through first one bulkhead, then another, until it reaches some suitable part of the vessel, about the centre of its length, where in like manner the bilge water from the other portion of the length of the vessel will also be collected from a similar arrangement of dashboards placed at the opposite angle, the space between these two sets of angular dashboards being devoted to a well or cistern, into which the lower end of the pump pipe dips."

[Printed, 6d. Drawings.]

A.D. 1858, March 10.—N° 481.

DAVIES, GEORGE,—(*a communication from Mortimer M. Comp.*)  
—"An improved eye or ring bolt" "This invention consists  
"principally in so constructing an eye or ring bolt that a hook,  
"line, or other fastening may be released from the bolt with  
"greater facility and in less time than from those of the ordinary  
"construction. The lower end of the body of the bolt is formed  
"into a shank, and has a screw thread cut upon it as usual. The  
"head of the bolt is formed of two jaws and a tongue. The  
"tongue works at one end upon a pin in one of the jaws, and the  
"other end thereof is formed into a tenon to fit the mortice in a  
"holdfast. This holdfast is forked at its lower end to work upon  
"a pin in the body of the bolt, and is morticed at its upper end  
"to fit upon the tenoned end of the tongue. There are a pair of  
"knuckle-jointed levers (the lower end being jointed to the body  
"of the bolt, and the upper end to the upper part of the holdfast,)  
"by the closing in of which the holdfast is moved over and upon  
"the tenoned end of the tongue to retain the latter securely in  
"its position, and by the opening of which the holdfast is with-  
"drawn so as to allow the tongue to be thrown up, and the line  
"or other fastening enclosed within the eye to be released."

[Printed, 5d. Drawings.]

A.D. 1858, March 11.—N° 487.

DAVIES, GEORGE,—(*a communication from Mortimer M. Comp.*)  
—"Improvements in life boats" The hull of the boat is con-  
structed either of wood or sheet metal, in the ordinary form and  
manner, excepting that the extremities of the boat are higher than  
usual. The boat is decked over, and there is a bulkhead dividing  
the hold into two compartments, having an aperture therein  
forming a means of communication between the fore and after  
holds. Air chambers at the stem and stern of the boat serve to  
buoy the boat in case of injury to the hull, and also to preserve  
the boat upright in the water, or to restore it to that position  
when capsized. "There is a hatchway in the forward part of the  
"deck through which persons can pass into the fore hold, and one  
"of the hatches when opened falls down upon a hinge and acts  
"as a valve, so as to close the aperture in the bulkhead, to

“ prevent the water which may enter the fore hold (when the  
“ hatches are opened in a heavy sea) from passing into the after  
“ hold.” The boat is propelled by means of a screw or propeller  
wheel driven by the occupants of the boat. Raised above the  
deck about midships there is a “look out,” the sides of which  
have plate glass inserted, through which the steersman can observe  
the course and direction of the boat, at the same time steering by  
means of lines attached to the rudder. There is also a ventilator,  
which is kept open by a spring, but closes by the pressure of the  
water when a sea sweeps over the deck.

[Printed, 7d. Drawings.]

A.D. 1858, March 18.—N<sup>o</sup> 556.

SUFFIELD, THOMAS.—“Improvements in pumps, especially  
“ adapted for ships’ purposes.” The invention consists of certain  
new arrangements of pumps, “whereby all liability to choke is  
“ avoided, and whereby a pump or two pumps, either single or  
“ double acting,” may be applicable as fire engines.

“ I form the suction pipe or channel through a passage apart  
“ and separate from the barrel in which the plunger works; the  
“ passage from the suction pipe to the barrel is fitted with a  
“ valve, opening inwards towards the barrel, and I prefer to use  
“ throughout those valves known as ‘Perreaux’s patent valves,’  
“ but other valves may be substituted for them.” “The delivery  
“ from the barrel takes place through a port fitted with another  
“ valve, opening outwards and into a nozzle. I prefer, for single  
“ pumps, to form a globe or air vessel on the nozzle, with an  
“ aperture in the dome. I close the top of the suction pipe or  
“ passage by a hinged cover, in order to obtain ready access  
“ thereto without at all interfering with the plunger or barrel or  
“ valves. Now, in order to convert a single pump into a fire  
“ engine on board ship where there is no sea connection, I close  
“ up the suction pipe to the hold, and connect a suction hose to a  
“ threaded collar made on the cover of the suction pipe, and  
“ throw the end of the hose into the water, close up the delivery  
“ end of the nozzle by a screw cap, and screw on to a threaded  
“ collar in the lower part of the nozzle, previously closed by a  
“ screw cap, a delivery hose; the space between the last named  
“ collar and the extreme end of the nozzle, forms an air vessel.

“ When two pumps are used, I then connect the delivery ports

“ from the two barrels by a pipe common to both, fitted with a  
“ dome globe or air vessel, and with two screwed collars. When  
“ for pumping purposes, the under collar is closed by a screw  
“ cap, and the delivery takes place through the upper collar. On  
“ the contrary, when to be used as a fire engine, the upper collar  
“ is closed and the hose screwed on to the under collar, the upper  
“ part of the vessel forming an air chamber. My invention also  
“ consists in providing suction pipes or passages leading to  
“ various parts of a ship or other structure, and in causing the  
“ upper ends of these pipes to terminate in a casting connected  
“ with or near to the ordinary or main suction pipe leading to the  
“ hold, or otherwise. All the suction pipes are closed by suitable  
“ screw caps, and by means of a goose neck, or other suitable  
“ coupling or connecting piece, the pump may be made to com-  
“ municate and draw liquid from any desired part of the ship or  
“ structure.” These improved pumps are applicable as portable  
pumps and fire engines.

[Printed, 1s. 2d. Drawings.]

A.D. 1858, March 26.—N<sup>o</sup> 638.

MOXON, WILLIAM, CLAYTON, JOHN, and FEARNLEY, SAMUEL.—“ Improvements in machinery for paying out electric  
“ telegraph cables, ropes, and other like articles.” The invention  
consists in “ certain arrangements of machinery whereby a given  
“ tension is maintained constantly on the cable or rope being  
“ payed out, and whereby, should the tension become greater  
“ than the cable is calculated to bear, the strain itself so acts upon  
“ the machinery as to release the breaks and allow the cable to  
“ run out freely; as soon as the extra tension is removed the  
“ apparatus brings the breaks into action, and the paying out  
“ takes place as before. The breaks in the form of straps or  
“ hooks, are suspended by fixed rods or bars from the short arms  
“ of two levers; a shaft serves as the fulcrum for the two levers,  
“ and this shaft is supported in bearings in a suitable frame.  
“ The long arms of the levers are or may be made in the form of  
“ loops, and these arms receive a shaft or roller which is capable  
“ of running to and fro thereon; upon the roller is a pulley, over  
“ which the cable to be payed out is passed. The extremities of  
“ the roller or shaft carry other pulleys, one on each end, and  
“ weights are connected directly to the roller or shaft or to the

“ pulleys by chains or cords in such manner that upon the  
 “ roller or shaft travelling on the arms towards the short arms of  
 “ the levers, the cords or chains carrying the weights become  
 “ wound round the roller or the pulleys, whereby the strain  
 “ exerted by the weights is maintained upon the cable; should,  
 “ however, the strain exerted by the cable itself overcome that of  
 “ the weights, then the roller or shaft is drawn so far towards the  
 “ fulcrum that the leverage exerted by the tension of the cable  
 “ becomes gradually diminished, thereby gradually releasing the  
 “ breaks until they are altogether freed from the break shaft.  
 “ Although we prefer to use weights yet springs may be substi-  
 “ tuted for them.”

[Printed, 6d. Drawings.]

A.D. 1858, April 5.—N<sup>o</sup> 719.

CLARK, WILLIAM.—(*A communication.*)—This invention con-  
 sists in the construction and use of a water tank, “for carrying  
 “ fresh water on board a ship or other vessel, with a treasure  
 “ chest in or attached to its bottom, and with a valve or valves  
 “ for letting out the whole or a great portion of its water, and  
 “ admitting air, and proper mechanism for operating the said  
 “ valve or valves, and with a gallery surrounding it to carry  
 “ passengers, whereby, when it is set free from the vessel in or  
 “ upon which it is carried, it is made to serve as a float to carry  
 “ crew, passengers, treasure, and other valuable property. It  
 “ also consists in a certain mode of applying the same on board  
 “ of a vessel, whereby during the safety of the vessel it is kept in  
 “ its place on board, but on the foundering of the vessel is caused  
 “ to detach itself therefrom. With this object in view I prefer  
 “ to make the total height of the tank or float such that the  
 “ bottom of the chest may rest upon the lower deck, while the  
 “ upper part of the tank may stand above the upper deck, that  
 “ part which reaches from the upper to the lower deck being of a  
 “ taper form, while the principal capacity which remains above  
 “ the upper deck is of a rectangular form, having suitable flanges  
 “ or parts of support resting thereon, which together with the  
 “ lower part are stepped or recessed into the decks to secure the  
 “ tanks in position.” “It further consists in a certain mode of  
 “ applying to such a tank or float an attached buoy, which, in  
 “ case of the said tank or float striking on a rock, or being other-

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"wise damaged sufficiently to cause it to sink, will be liberated by  
 "the sinking of the tank or float, and caused to remain at the  
 "surface of the water, and hence be made to indicate nearly the  
 "position of the said float or buoy at the bottom, for the purpose  
 "of enabling the treasure or other property in the safe to be  
 "recovered."

[Printed, 7d. Drawings.]

A.D. 1858, April 7.—N<sup>o</sup> 749.

FOSTER, ELBRIDGE.—The invention consists in a movable and adjustable berth, "provided with one or more hinged or attached flaps or keels, and folding inflatable air chambers, whereby the same may be used as a life preserver on steam and other vessels."

[Printed, 6d. Drawings.]

A.D. 1858, April 10.—N<sup>o</sup> 781.

MCCRAE, DANIEL.—This invention relates to the adaptation and use of a greasy substance as a preservative coating for ships' bottoms and other exposed surfaces. The grease employed for this purpose is of a peculiar character. What is known as "bone grease" is preferred for the purpose, that is to say, the species of fibrine grease obtained from the cells of bones by boiling; other greases or greasy matters may however be employed, such as that obtainable from "kitchen stuff;" but oils and tallow or lard are not available.

This peculiar grease may have "blue stone" or sulphate of copper mixed with it, or it may have various poisonous matters incorporated.

[Printed, 4d. No drawings.]

A.D. 1858, April 10.—N<sup>o</sup> 784.

RAE, JAMES.—This invention relates to improvements in the construction of the keels, stems, and stern posts, of iron steam and sailing ships or vessels, and in the junction of the keelson therewith. It consists in cutting a groove in the solid bar, sufficiently deep to receive a keelson plate the proper thickness, according to the dimensions of the ship to be built; the said keelson plate to extend from

stem to stern, and to any height up the posts that may be found necessary; the keelson plate to be fitted tight into the groove cut in the keel, stem, and stern posts, and then to be firmly rivetted and caulked, thus uniting the solid keel, stem, and stern post, with the keelson in a most efficient manner, without running any risk of leakage, to which a keel composed of two or more plates is more or less subject, as constructed heretofore. A modification of the above consists in rolling, planing, or otherwise forming a rabbet or rabbets, to produce a rib on the upper edge of the solid keel, stem, and stern post, and rivetting the keelson plate or plates to the same; this may be extended to any height up the stem and stern post, which not only increases the strength of the post, but affords the means of properly securing the frames, ribs, or timbers of the ship.

[Printed, 10d. Drawings.]

A.D. 1858, April 16.—N° 826.

**BROWN, GEORGE GIBSON.**—"Improvements in ships' binnacles." According to this invention, in place of fixing the binnacle to the deck, it is suspended by gimbles, in a standard fixed to the deck, "so that the binnacle itself always maintains a nearly vertical position, and the lamps for lighting the binnacles are placed under in place of over the card. The light from the lamps passes upwards through the bottom of the box containing the compass, which is formed of fluted glass in order to disperse the light, so that a uniform illumination may be obtained. The compass card is formed of talc or other suitable material, and is suspended within its box or case by gimbles in the ordinary manner; but in place of the point for supporting the needle being fixed in a metal bowl, as heretofore, it is carried by a band of metal sufficiently narrow not materially to obscure the light. By arranging the binnacle in this manner, the lamps are maintained constantly in a vertical or nearly vertical position, and have much less tendency to smoke the parts of the binnacle which are near them, and even should the glass at the bottom of the compass box or case become slightly smoked, it would not interfere with the observation of the instrument."

[Printed, 6d. Drawings.]

A.D. 1858, April 22.—N° 886.

GILMOUR, GEORGE.—“A new or improved messenger shackle block.” The object of the invention is “to enable a purchase block to be connected with a chain cable, when such may be attached to an anchor, a vessel or other article, and particularly when said chain cable may be under water.” For this purpose a pulley, provided with three or any number of sheaves, is so connected with a roller by extensions of the pulley frame, that there may be a chain space or passage between the said roller and pulley, the roller turning on a pin or bolt passing through the extended parts. Between the sheave or sheaves of the pulley and the chain passage, a pin extends through the pulley frame, and serves as a journal or fulcrum of a bifurcated pawl, which turns on the said pin, and across the chain space or passage. In applying the shackle block to a chain or rope which it is desired to clutch, the chain or rope is introduced into the passage. The block is then lowered down on the chain or rope to the distance required, the pressure of the chain against the pawl causing the said pawl to slip freely on it. As soon as the block has attained the depth required, the purchase rope may be made to raise the block, and thus cause the pawl to pass between the links of the chain, and rest against the roller, so as to firmly clutch or fasten the block to the chain.

[Printed, 6d. Drawings.]

A.D. 1858, April 22.—N° 891.

HARRINGTON, TIMOTHY.—(*Provisional protection only.*)—“An improved method of ventilating the hold and other parts of ships.” The invention consists “in ventilating all parts of ships by means of one or more main pipes leading into a funnel or chimney, or into a shaft fixed for the purpose in any convenient part of the deck. In the case of steam vessels I lead the main pipes into the funnel or into a casing round the funnel, and in sailing ships I erect a ventilating shaft and lead the pipes into it. By means of branch pipes I cause the main pipes to communicate with the cabins and with all other parts of the vessel requiring ventilation. In some cases I increase the draft in the shafts or funnels by means of a steam jet.”

[Printed, 3d. No drawings.]

A.D. 1858, April 23.—N° 903.

**LUNGLEY, CHARLES.**—"Improvements in the construction of  
" portable ships and boats, and their appurtenances." This inven-  
tion relates to a novel mode of constructing ships and boats, which  
will admit of being taken to pieces and stowed away in a compa-  
ratively small space when not required for use, and of being en-  
larged or diminished in capacity as required to suit changing  
circumstances. The ships or boats are made of plates of metal,  
which are provided with flanges standing up from their edges, for  
the purpose of facilitating the attachment of the plates and afford-  
ing rigidity to the structure. "The plates, which are intended to  
" form the head and stern of the boat, are tapered and shaped to  
" a suitable form, and bolt holes being punched through the  
" flanges of all the plates, they may be readily connected together  
" by bolts and nuts. Or, in place of using flanged plates, I may  
" rivet angle iron to the plates, and connect the plates together  
" by passing screw bolts through the angle iron. By giving a  
" uniform shape to the middle lines of plates, I am enabled by  
" the addition or subtraction of one, two, or more lines of plates  
" in the direction of the ship or boat's length, to enlarge or  
" diminish the capacity thereof, and in like manner by raising or  
" lowering the height of the gunwale, and increasing the length of  
" the boat, the same object may be attained. I also propose to place  
" between the central line of junction of the plates forming the  
" hull of the ship or boat, strips of iron to form a keel, stem and  
" stern posts, and rudder guard, and also to apply decks, bulk-  
" heads, &c., to the vessels. 'The metal used in the construction  
" of my portable vessels, I propose to coat with zinc or enamel or  
" other protector from oxydation; I propose also to provide both  
" ends of the vessels with steering apparatus, and when I fit a  
" vessel with a screw propeller, I prefer using a peculiar construc-  
" tion of double rudder. The screw is to be fitted so that its  
" height may be adjusted at pleasure. For this purpose it may be  
" mounted in a trunk or in a frame, having a regulating wedge,  
" which, as it is drawn in, will adjust the screw and shaft to the  
" desired level. The screw being so placed, I use two rudders,  
" one on each side of the shaft. These rudders are made hollow  
" to afford a free passage for water through them, and they are so

" mounted that the one rudder may be moved at any angle, while  
 " the other remains amidship. To the two rudders, a tiller having  
 " a double fulcrum is applied, which acts so as to put the one  
 " rudder over without the other, and vice versâ, thereby enabling  
 " one fairly to act without any impediment from the other. I  
 " also propose in some cases to fit a rudder at each end of the  
 " vessel in such a way, that both rudders may be used to advan-  
 " tage, either together or separately. These rudders will hang on  
 " to the keel and post, and will be capable of swinging completely  
 " round, so as always to have their tails or greatest length aft. In  
 " order that the rudders may present the least possible resistance  
 " to the water, I propose to chamfer their forward ends. The  
 " tiller is fitted so that on the vessel requiring to go the reverse  
 " way, it will only be necessary to lift the tiller, and the tail of the  
 " rudder will swing the way required, thus the foremost rudder  
 " may be used according to the amount of strength that can be  
 " put to it, but will always hang to its place, and cannot obstruct  
 " the progress of the vessel.

" To permit of boats constructed according to my invention  
 " being used as land carriages, I propose to build up in them  
 " trunks, in which are mounted wheels capable of being raised or  
 " depressed by means of regulating screws, their bearings sliding  
 " for that purpose in vertical guides, and being provided with  
 " springs to ease the draft."

" In order that the anchors to be used with these boats may be  
 " both portable and strong, I propose to make the crown of the  
 " anchor of two plates of iron rounded and lapping at their ends,  
 " and carrying between them plates which form the flukes. The  
 " shank I secure to the crown by a bolt, and to distribute the  
 " strain, I connect the crown at both ends with the shank or the  
 " shackle by means of tension chains. The shank may for large  
 " anchors be made in two or more pieces to facilitate its trans-  
 " port."

[Printed, 1s. 4d. Drawings.]

A.D. 1858, April 27.—N° 931.

TOVELL, GEORGE RANDEFIELD. (*Provisional protection only.*)

—" This invention relates to modes of constructing ships or other  
 " vessels in two parts, thus enabling them when so connected to

“ convey cargoes and passengers safely from port to port or across  
 “ the sea. When the vessel is separated by means of suitable con-  
 “ trivances, with which it is provided, the cargo may be conveyed  
 “ up rivers or shallow waters without breaking bulk or discharg-  
 “ ing cargo to the place of discharge. One of the modes which  
 “ I adopt for this purpose is the following :—The vessel is divided  
 “ into two portions horizontally, the upper portion being provided  
 “ with a flat bottom ; the rudder is also capable of being sepa-  
 “ rated into two portions, so that when divided the upper portion  
 “ forms a flat-bottomed vessel, and the under portion may form  
 “ another separate vessel, which may be used for purposes of  
 “ navigation.” The two parts of the vessel may be attached to  
 each other by means of capstans, or in any other suitable  
 manner.

[Printed, 3d. No drawings.]

A.D. 1858, April 28.—N° 948.

**TAPIÉ, LUCIEN.**—(*Provisional protection only.*)—This invention  
 relates to an improved mode of ship-building, in which the wooden  
 ribs or timbers are “ entirely dispensed with, the hull being formed  
 “ of an exterior longitudinal planking, and of an interior one  
 “ crossing the first at an angle of about 45° ; the space between  
 “ them is filled up with felt or other suitable material. The ends  
 “ of these plankings are inserted in suitable grooves in the keel,  
 “ stem, and stern post, which latter are situated in the interior of  
 “ the hull, the keel being further steadied by two carlings to which  
 “ the moulds are bolted or otherwise secured, whereas the top  
 “ of the inner planking is solidly fixed to its rabbets.” “ Strong  
 “ iron hoops are fixed at suitable distances apart over the inner  
 “ planking, instead of the ordinary ribs or timbers. Strong  
 “ clamps serve as longitudinal bindings, and for supporting the  
 “ deck beams, and strong transverse partitions are fixed in the  
 “ hold close to the masts, in order to steady the form of the  
 “ hull.”

[Printed, 3d. No drawings.]

A.D. 1858, May 7.—N° 1031.

**STOTHARD, DANIEL, JONES, JOSEPH, JONAS, DAVID,**  
 and **JONAS, BENJAMIN WOLF.**—(*Provisional protection only.*)

—This invention, which has for its object “to improve the present  
“ form and construction of ships’ blocks with the view to increase  
“ or diminish the strain upon the rope, cable, or otherwise, as  
“ may be required, consists of an outer sheave or block furnished  
“ with a channel in which two or more pulley wheels are so  
“ arranged as to admit of the rope, cable, or otherwise, impinging  
“ upon the peripheries ” and increasing or diminishing the space  
“ between the same through the medium of a concentric slot  
“ bearing, in which one of the lesser wheels revolves, the larger  
“ or fixed wheel moving from a common centre, as heretofore.”

[Printed, 3d. No drawings.]

A.D. 1858, May 8.—N<sup>o</sup> 1036.

NEWTON, ALFRED VINCENT, — (*a communication.*) — This invention “relates to the production of a tough and durable water-  
“ proof fabric, which in its unfinished state or softened state is to  
“ be wrought into a variety of useful forms. To this end woven  
“ wire cloth or pierced sheet metal is coated on both sides with  
“ india-rubber vulcanite compound in a plastic state. If the wire  
“ cloth is coarse, and it is desired to cover it cheaply, it is placed  
“ between two sheets of the compound, and the whole is passed  
“ together between calender rollers, which cause the sheets of  
“ vulcanite to adhere between the meshes of the wire without the  
“ wire cutting the compound. But when a smooth surface is  
“ desired, the wire cloth is to be more thickly coated, and the vul-  
“ canized compound is spread upon it in the same manner as upon  
“ cloth with calender rollers. From this fabric it is proposed to  
“ construct boats,” &c. “In manufacturing boats, portmanteaus,  
“ or other articles, according to this invention, they may, in order  
“ to enable them to bear hard usage, have any required amount of  
“ strength given them by cementing upon the moulded plates or  
“ pieces of fabric composing the same, bands, strips, or braces of  
“ the compound fabric, the same being cemented at the junction  
“ of these parts or at the parts requiring the greatest power of  
“ resistance, the braces or strips being first formed to correspond  
“ to the parts to which they are respectively to be applied.”

[Printed, 4d. No drawings.]

A.D. 1858, May 13.—N<sup>o</sup> 1077.

**SIMONS, WILLIAM.**—(*Provisional protection only.*)—"Improve-  
ments in the construction of iron ships or vessels." This  
invention "relates to the arranging of the deck beams of ships  
diagonally, or with the reverse inclines, so as to gain superior  
strength. Each line of beams is disposed so that the indi-  
vidual beams lie at an angle with the keel line of the ship, and  
in every deck the direction of the angle is reversed." It "also  
relates to the diagonal disposition of the stantions, each stan-  
tion or hold-fast beam or bar being inclined " "in one or more  
lines, the lines being reverse to each other, and the bars being  
attached at the intersections, and at their upper ends, where  
they join the beams. In constructing the actual shell of the  
ship no filling-up pieces are used, but what may be called long  
filling-up plates are adopted. These plates are rolled in long  
lengths, with central projecting ribs, which form the filling-up  
pieces, and abut against the frames, and they are interposed  
between the ordinary short plates of the shell framing. In  
commencing to build a ship in this way, the 'floor' is laid with  
diagonal plates in the first instance, and the beams of each  
deck all the way up are then reversed in each case; and in  
building iron steamers according to this invention, a sufficient  
number of plates are left out of the side of the ship, which is  
otherwise finished up in the ordinary way. The engines and  
boilers are then put into the hull through the opening, and the  
latter is then closed up and the ship completed. This in-  
vention also comprehends the inverting or reversing the knees  
of the ship, that is to say, the knees are disposed above instead  
of below the deck, and iron plates are laid above or over  
the lines of knees throughout the ship, fore and aft."

[Printed, 3d. No drawings.]

A.D. 1858, May 17.—N<sup>o</sup> 1098.

**RAYMOND, WALTER.**—(*Letters Patent void for want of final specification.*)—"Improvements in life rafts." The life raft is  
to be formed of "two double galvanised iron cases, cylindrical at  
top, and flat or nearly so at bottom." "The inner case is corru-  
gated with round ends, and partitioned within; the concave

“ portion is filled in with cork, attached by marine glue or  
 “ otherwise; then a casing of cork over that; this to fit tightly  
 “ inside of an outer case made of galvanised sheet iron.” The  
 outer case is to be surrounded at intervals with hollow bands,  
 filled in with cork or other suitable material, to act as fenders,  
 and to contain swivel, circular, or other rings to receive the  
 lashings. “ The communication between the two cases and  
 “ lining will be by two holes, with suitable air-tight covers, one  
 “ being a large oval orifice, to enable a person to reach the  
 “ bottom, and through which bags containing the mails, pro-  
 “ visions, treasure, or other articles can be speedily deposited and  
 “ secured. The opposite opening is circular, with an air-tight  
 “ cover, and having a pipe attached following the inside curve of  
 “ the case to the bottom, in order to admit atmospheric air to  
 “ speedily empty it of its liquid contents when required ” “ A space  
 “ is left between the two cases, and the lining of cork even with  
 “ the openings, fitted with a suitable cover, bag, and plug, to  
 “ contain rockets,” &c. “ To the outer cases are fitted angular or  
 “ round iron bars, so arranged that they can be immediately and  
 “ securely attached to the corresponding swivel eyes, thus  
 “ forming twin tubes, with their corresponding bars and marks.  
 “ When these bars are thrown across and connected, I form  
 “ a deck on the same, by using bamboos or rods of other suitable  
 “ buoyant material.”

[Printed, 3d. No drawings.]

A.D. 1858, May 25.—N° 1161.

GALITZIN, PRINCE ANTOINE; SOUSCHKOFF, SERGE; and  
 GUÉRINOT, PIERRE EMMANUEL — (*Provisional protection*  
*only*) — “ An improved apparatus intended to prevent boats or  
 “ ships to be destroyed and sunk when running full against  
 “ each other ” The apparatus “ consists of iron rods or bars,  
 “ one end of which is pointed, whilst the other is provided with a  
 “ large wooden disc or buffer. The said rods or bars run and  
 “ may slide through guiding pieces placed fore and aft, and can  
 “ penetrate into the hull of the boats or ships provided with  
 “ them, when the buffers meet with an obstacle. At the places  
 “ where the points are to strike the hull, the latter is perforated.

“ and, behind the holes so made, blocks of lead are fixed, through  
“ which the points penetrating, the concussion is thereby con-  
“ siderably deadened or diminished.”

[Printed, 8d. Drawings.]

A.D. 1858, May 25.—N° 1163.

WEBSTER, WILLIAM.—“ Improved machinery for the propul-  
“ sion of vessels.”—“ My improvements relate to the shape of the  
“ propellers, the mode of housing them, and the mode of regu-  
“ lating their speed. Preparatory to the employment of these  
“ improvements, I modify somewhat the hull of the vessel. The  
“ model I prefer resembles that of the modern clipper ships, but  
“ is much finer, having more dead wood forward and aft. The  
“ lower part of the vessel's fore peak, or entrance and run, is built  
“ solid inside. I also place in the ends of the ship air chambers  
“ which give her buoyancy, and counterbalance the great weight  
“ of the propellers, and thus make the ship easier in a sea-way.”  
The propellers are made in the shape of a whale's fin, and may  
be attached to the shaft in any convenient mode. They may be  
placed sometimes at the bow, as well as at the stern of the ship.  
“ When it is desired to use sails alone on the vessel, I cover in  
“ the fins by slide ports, which descend one on each side through  
“ a trunk which runs down from the deck.” When the ports  
are down, the fins are enclosed in a water-tight well, from which  
the water can be drawn off through a hose leading to the ship's  
pumps. When this is done, a man can descend to repair, unship,  
or replace the fins at pleasure.

[Printed, 7d. Drawings.]

A.D. 1858, May 25.—N° 1165.

WEBSTER, WILLIAM.—These improvements relate to the  
masts, spars, and standing rigging of vessels. “ The masts I  
“ make each of one piece of timber, and I secure them to the hull  
“ by wire shrouds placed at an unusually large angle to each  
“ other, and so that the lower ends of the after shrouds of  
“ the foremast will be immediately contiguous to those of the  
“ forward shrouds of the mainmast, and so with the others.  
“ The yards I make much longer than usual; they are secured to

“ the masts by hinged truss bands, having clamp screws to hold  
“ them at any desired point on the mast. The yards are held in  
“ bands hinged to a bolt, which rotates in a yoke attached to the  
“ band which grasps the mast; this attachment allows motion to  
“ be given to the yards in any required direction. The lifts are  
“ attached to hinged slide bands clamped to the mast at the  
“ proper distance above their respective yards. The bolt of the  
“ hinge of these bands has a ring at its lower end, to which the  
“ chain slings of the yards are hooked. There are eye bolts on  
“ the sides of the bands, to which the lifts are attached. The  
“ bands of the topsail yards are split for the reception of a  
“ grooved hoop or ring, which may be rotated in them as a sheave  
“ is rotated in an ordinary pulley. The yards work inside the  
“ shrouds, and can be hoisted up or lowered down upon the rail  
“ as readily as sails are now hoisted and lowered,” and when on  
the rail, can be pointed nearly fore and aft. “ The topsail yard  
“ may be rotated on its own axis in its band by means of the  
“ annular sheave before mentioned moving in the slit in the  
“ band. The bowsprit I make to run inboard. I do not connect  
“ the masts together by stays, as I rely upon the great inclination  
“ of the shrouds to give them sufficient stability. Nor do I  
“ connect the bowsprit to the masts by anything more than a  
“ small cord, which will yield to a less force than would be  
“ required to carry away the bowsprit.”

[Printed, 7d. Drawings.]

A.D. 1858, May 25.—N<sup>o</sup> 1173.

WITTY, ROBERT CHRISTOPHER.—(*Provisional protection only.*)

—This invention has for its object, “ improvements in protecting  
“ ships of war and land batteries and fortifications from injury  
“ from shot and other projectiles. For this purpose I apply  
“ blocks of vulcanized india-rubber to the sides of the ship of  
“ war or to the face of the battery or fortification to be protected.  
“ The blocks which I employ are hollow, and of a cylindrical  
“ form, and they are applied to the side of the ship or face of the  
“ battery or fortification, so that the axes of the cylinders run  
“ parallel with the side or face to be protected. Over the  
“ cylinders, which are placed as closely together as possible, slabs  
“ of vulcanized india-rubber are fixed so as to produce a flush

“ surface to receive the first shock of the shot or other projectile,  
“ and this shock it transfers to the cylinders underneath, which  
“ act as springs, modifying the intensity of the blow, and  
“ spreading its action over a considerable surface. Sometimes  
“ for the covering slabs of vulcanized india-rubber, I substitute  
“ covering slabs of wrought iron, or in some cases I build up the  
“ covering slabs of alternate layers of wrought iron and vulcanized  
“ india-rubber.”

[Printed, 3d. No drawings.]

A.D. 1858, May 29.—N° 1216.

HEBSON, DOUGLAS.—(*Provisional protection only.*)—“ Im-  
“ provements in ships’ gear, part of which is applicable to forming  
“ ropes for general purposes.” “ The object of this invention is  
“ the construction of masts, yards, and other spars, and the  
“ standing rigging for ships or other navigable vessels, of the  
“ necessary strength, with considerably diminished weight and  
“ bulk as compared with those now in use, and consists in  
“ forming them wholly, or in major part, from steel,” or other  
metal “ prepared from iron, having like properties, which may  
“ be used alone or in combination with wood and iron in the  
“ formation of masts, yards, and other spars; and in the forma-  
“ tion of wire rope, to be used for standing rigging & for other  
“ ordinary purposes, from steel or other metal prepared from  
“ iron, having like properties, to which iron wire and other rope  
“ is now applied.”

[Printed, 3d. No drawings.]

A.D. 1858, June 11.—N° 1331.

LEMIÈRE, LÉONARD FRANÇOIS.—“ Improvements in treating  
“ hemp or tow for the calking of ships and vessels, parts of  
“ which improvements are applicable to washing and cleansing  
“ textile articles or fabrics impregnated with greasy or oily  
“ matters, and in the apparatus connected therewith.”

The invention consists, first, in the preparation of oakum of  
better quality than that obtained from untwisted tarred ropes and  
cables unfit for service, by submitting new hemp or tow to a  
bath of tar, formed by a composition consisting of “about

“ twenty-two pounds crystal of soda, about two pounds three  
“ ounces salt of soda, and about sixteen pounds seven ounces of  
“ tar to every twenty-two gallons of pure water employed.” This  
composition being heated near to ebullition in a trough or suitable  
apparatus, the tow is introduced and becomes saturated with tar ;  
it is then taken out of the trough, dried in the open air and  
combed, and is ready for use.

Secondly, “ in the application of the said chemical composition  
“ and apparatus with slight modifications or additions to scouring  
“ and washing linen and other textile articles, fabrics, and sub-  
“ stances impregnated with fatty or oily matters.”

[Printed, 7d. Drawings.]

A.D. 1858, June 16.—N° 1359.

**BOUSFIELD, GEORGE TOMLINSON**,—(*a communication*.)—The  
object of this invention is to cheapen the construction of small  
boats, by reducing the time now required for building them, and  
at the same time employing labor of a less expensive character ;  
and the invention consists of a certain apparatus for sustaining  
and confining the parts that make up the frame of a small boat,  
in the same relative position that they occupy in the finished boat ;  
and in certain useful accessories to such an apparatus, it being  
understood that the apparatus is of use only when several boats  
of the same model or pattern, or nearly so, are to be constructed.

In order to construct the apparatus, the model and dimensions  
of the boats to be built are first to be determined upon ; as also  
the number of ribs, and their situation in the boat. A piece of  
metal of the length and curve of the desired keel and stem and  
stern pieces is then procured, having in it a groove or cavity of  
the same cross section or nearly so as those pieces, such piece of  
metal being provided with holes or slots in the bottom of the  
groove to admit the fastening. To this piece, other pieces are  
attached, having an L-shaped groove therein, the two sides of the  
L corresponding in curvature with the top and inner sides of the  
gunwale of the boat to be built. These gunwale supporters are  
then united with the keel supporter by means of rib supporters,  
each of which has in it a groove corresponding in cross section  
with the ribs of the boat to be built. These grooves are of the  
same curvature as the ribs, and occupy relatively to each other  
the same position that the ribs of the finished boat are to hold.

The sides of the grooves in the keel piece are cut away where these rib supporters are joined to it, and slots are to be cut in the bottom of the grooves of the rib supporters.

This frame or apparatus may be made of wood, or of pieces of wrought iron properly secured together, or of pieces of cast iron, or all cast in one piece. It is preferred to make it of cast iron in sections, united by proper bolts and flanges. Its office is to support and sustain in proper relative positions the various parts that make up the frame of a small boat, and its construction may be modified so long as it will still serve this purpose, when aided by screws or clamps to confine the various parts in place; and upon such a frame boats may be built in various ways. The apparatus is so mounted or supported that it may with ease be turned and held in various positions, and means are provided for starting the boats off the frame, after the clamps or screws are removed.

Boats of different lengths may be made without incurring the whole expense of a complete frame, by separating a frame or apparatus in the middle, and introducing pieces of various lengths made up of portions of keel and gunwale supporters, and a greater or less number of rib supporters, and then attaching the whole together so as to make up an apparatus of greater size than the original one: and the grooves in the various supporters may be of other sections than those described, so long as they will perform, in conjunction with the screws or clamps or their equivalents, the office of confining the various parts that make up the frame of a boat, each on its own supporter.

[Printed, 1s. 10d. Drawings.]

A.D. 1858, June 16.—N° 1366.

WESTWOOD, JOSEPH.—(*Provisional protection only.*)—This invention relates “to the internal construction and the plating of  
“ iron ships, the object being to obtain great stiffness in the struc-  
“ ture, and for ships of war to enable them to resist the action of  
“ shot upon their hulls. To ensure great stiffness with compara-  
“ tive lightness, I use hollow beams, which I form of vertical  
“ plates of metal, having solid liners between them, and angle  
“ iron bolted to their outside faces at their upper and lower edges.  
“ The lower angle irons continue beyond the ends of the beam  
“ proper, and are bent round and bolted to the opposite sides of  
“ the stiff angle iron constituting the ship’s frames. In like

" manner the ends of the vertical plates are bolted to the ship's  
" frames. For the purpose of ensuring a good firm joint in the  
" plating of iron ships, I propose, when using a double thickness  
" of plates, to arrange them so that they shall present three  
" thicknesses at the joint. Thus I take two plates and place  
" them so that their edges will form a butt joint; over this joint  
" I lap a plate which will form with the under plate a double  
" thickness of plating in one direction, and under this butt joint  
" I lay another plate which will form with the plate which it  
" overlies, a double thickness of plating in the opposite direction.  
" Thus for each butt joint I have two overlapping plates (one at  
" each side of the abutting plates) and by passing bolts through  
" the whole on either side of the butt joint, I secure a firm  
" fastening. In order to secure the exposed parts of the hull of  
" ships of war against shot, I propose to plate the upper part  
" with thick plates (by preference of steel) formed with a rebate  
" at their edges into which the adjacent plates will fit and produce  
" a flush joint. This joint I cover with a plate or strip of metal,  
" and then by three lines of bolts rivet the whole firmly  
" together."

[Printed, 3d. No drawings.]

A.D. 1858, June 19.—No 1386.

WINANS, ROSS, and WINANS, THOMAS.—" A new and useful  
" improvement in the form of the hulls of steam vessels." "The  
" shape of the steam ships heretofore constructed has been such  
" that when changing from an upright to an inclined position,  
" different figures, and consequently varying resistances, are pre-  
" sented to the action of the winds and waves respectively, which  
" tend to keep the vessel constantly rolling. The object of our  
" invention is to diminish this variation of resistance to the winds  
" and waves which causes a vessel to roll, and also to diminish  
" those resistances which prevent the vessel when 'careened,' or  
" inclined to one side, from 'righting' or returning to its normal  
" upright position, while at the same time we obtain increased  
" strength and stowage, and a capacity for greater average speed.  
" We accomplish these objects by giving to the hull such a form  
" that the transverse section of the exterior in any part will be  
" represented by a circle. The hull of a vessel having the form  
" which we propose is a spindle, which may be constructed of any

“ suitable materials and with any kind of framing that may be  
“ deemed advisable. At every point in its length the cross sec-  
“ tion of the hull is a circle, and its longitudinal axial section,  
“ taken in any direction, is formed of two arcs of a circle. Such  
“ a hull when loaded may be immersed to or nearly up to the axis  
“ of the spindle.” “The stability necessary for a vessel of this  
“ form when unloaded may be given to it by placing the ma-  
“ chinery at a point low in the vessel, or by ballast, or by both  
“ combined, as may be deemed most convenient or advan-  
“ tageous.”

“ In an application for another patent made simultaneously with  
“ the application for this, we have described the arrangement of a  
“ propelling wheel, which we consider to be the most advanta-  
“ geous for use with the spindle-shaped hull, but the kind of  
“ propeller used, or its position, may be varied at the discretion of  
“ the constructor.”

[Printed, 7d. Drawings.]

A.D. 1858, June 19.—N<sup>o</sup> 1387.

WINANS, ROSS, and WINANS, THOMAS.—“A new and im-  
“ proved steam vessel.” “Our invention, which relates more  
“ particularly to ocean steamers, and has for its object the attain-  
“ ment of a more constant rate of progression under different  
“ conditions of weather than is attainable in vessels of the ordi-  
“ nary form, consists in the combination of a hull which may be  
“ represented by the two ends of a spindle divided transversely  
“ near the middle of its length with a transverse vertical propeller  
“ occupying a space between the two portions of the spindle,  
“ which are secured together by a suitable framing or sleeve  
“ firmly attached to their adjacent ends, and extending over the  
“ propeller, thus combining the two ends and the connecting  
“ frame into a structure possessing the requisite rigidity and  
“ strength. Our invention also comprises the frame which we  
“ call a ‘sleeve,’ and the series of plates which we call ‘ribs,’ for  
“ connecting the ends of this frame respectively with the adjacent  
“ ends of the two compartments of the vessel, steadying the  
“ vessel in the manner of a keel, and together with the sleeve  
“ directing the water to and from the blades of the propeller.  
“ And it further consists in connecting the two end portions of  
“ the spindle-shaped hull by means of towers and a bridge be-

"tween them, which will afford ingress to and egress from each end of the hull, and also afford facilities for the ventilation of the two parts of the hull."

The propeller consists of a water-tight drum, properly braced on the inside, the periphery of which nearly coincides with the general surface of the spindle, and carries the propelling blades, which may be of any suitable shape, and have any required inclination to the axis of the drum.

"The two parts of the hull are connected together, and the propeller enclosed between them by the following contrivance:— Around their outer surface, next to the space occupied by the propeller, ribs or standards are fastened at short intervals; these ribs are formed of flat metallic plates, and are arranged in planes passing through the axis of the hull. The ribs project a little beyond the blades of the propeller, and their inner and outer edges are flanged to facilitate fastening them by bolts or rivets to the hull at their inner edges and to the sleeve at their outer edges. The sleeve "has a length equal to that of the two sets of ribs and the space (between them) occupied by the propeller, and includes the whole."

[Printed, 7d. Drawings.]

A.D. 1858, June 19.—N° 1388.

WINANS, ROSS, and WINANS, THOMAS.—"A new and useful improvement in ocean steamers."

This invention relates to the improvement of ocean steamers, not essentially different in form from those hitherto in general use. The improvement is to be effected by fitting the vessel with a water-tight trunk, for the accommodation of a vertical transverse propelling wheel, of larger size than could advantageously be used under any plan hitherto devised. The propeller, which consists of a water-tight drum having screw blades set upon its periphery, is arranged in this trunk in such manner that its blades will project out of the trunk, beyond the surface of the vessel at the bottom and on both sides. When the blades of the propeller project at the sides and bottom, but not beyond the line of the keel, the keel itself and the timbers or framework adjoining it may be strengthened, to give the requisite stiffness and strength to the bottom of the hull, thus compensating for the want of

continuity in the sides in the part occupied by the trunk. That portion of the hull which is above the trunk may also be strengthened by a truss or other framing, in a manner similar to that in which long river boats are stiffened. In some cases it might be deemed advisable to allow the propeller to project below the straight line of the keel, and to bend or curve the keel, or to place timbers or framework below to strengthen the hull, and thus retain the advantages of a continuous keel. In certain forms of vessels, the breadth being much greater than the depth, it would be more convenient to use two transverse propelling wheels, arranged side by side in the trunk, and for the purpose of strengthening the vessel, a central partition might pass through the middle of the trunk to any distance fore and aft of it, and it might extend from the keel upwards to any required height. If the vessel should be constructed with reference to the employment of a trunk and propeller or propellers of this kind, the section of the hull below the water line in the parts adjacent to the trunk, should be made concentric with the propeller or propellers at as many points as possible, in order that the greatest area of propelling surface may be projected.

[Printed, 7d. Drawings.]

A.D. 1858, June 21.—Nº 1392.

ANDERSON, SIR JAMES CALEB.—“Improvements in locomotion, parts of which are applicable for other purposes.” One portion of these improvements consists in obtaining a powerful blast for locomotive carriages, blast furnaces for ventilating mines, manufactories, and all descriptions of houses and ships. To create this blast, “I fix horizontally a pipe, of at least twelve inches diameter extending from the front of the steam carriage to the front of the ash-pit under the fire-place of the boiler, or to fixed boilers. The pipe is to be open at both ends, into the front opening of the horizontal pipe a small pipe of about an inch in diameter is to be inserted for a short distance; air being forced by a fan through the small pipe, it will retain its velocity for a considerable distance within the large pipe without expanding, and will draw along with it a great volume of air, by which an intense blast can be obtained by a comparatively small power.”


[Printed, 5d. No drawings.]

A.D. 1858, June 24.—N° 1427.

ROBINSON, JOSEPH.—(*Provisional protection only*).—"Im-  
"provements in applying and adapting water-closets to ships so  
"as to insure the safety and more perfect ventilation of the  
"same." The pipe from each closet is to be in communication  
"with "a main sewer pipe, connected to a powerful exhausting  
"pump, worked either by hand, steam power, or other suitable  
"means, so as always to maintain a partial exhaustion of the  
"sewer pipe or pipes, and thereby cleanse the closets, ventilate  
"the ship, and insure its safety, from the fact of there being but  
"one outlet for any number of water-closets."

[Printed, 3d. No drawings.]

A.D. 1858, June 25.—N° 1437.

WESTWOOD, JOSEPH.—(*Provisional protection only*).—"The  
"object of this invention is to cover the exposed parts of the  
"hull of wooden and iron ships, and also of batteries with  
"plates of iron or steel of sufficient thickness to resist the per-  
"cussive force of heavy shot. This I propose to do by the use  
"of rebated plates, which will enable me to form secure lap  
"joints. In covering the exposed parts of the hull of wooden  
"ships with these plates, I use screw bolts for securing them in  
"place, but for iron ships I prefer the use of rivets. By rebating  
"the adjoining plates, and getting a good lap, it will be under-  
"stood that one row of screw bolts or rivets will suffice, in place  
"of two, as ordinarily used to make good one joint, and thus  
"an important saving in the cost of plating a vessel will be  
"effected. To prevent the shot from striking the bolt heads, I  
"propose to sink them in the bolt holes in the plates, instead of  
"bringing them flush with the face of the covering plates."  
Instead of bolting the plates directly to the planking or plates  
of the ship or battery, it is proposed to bolt or secure thereto  
in parallel lines, or nearly so, angle iron of which  is either  
the whole or the half section. The flanges of these angle  
irons will form with the plates overlapping joints, and hold  
the plates securely in position. "The outer heads of these  
"bars of iron I propose shall not come flush with the outer  
"face of the plates, but shall form with the adjoining plates a  
"recess, sufficiently narrow, however, to prevent any shot that

“ may hit the edges of the adjoining plates striking the retaining  
“ bars. By this arrangement the lines of bolts employed for  
“ retaining the outer covering plates in position will be protected  
“ by those plates, and there being no bolt-holes through the  
“ plates, the risk of their splitting from the percussive force of  
“ shot will be greatly diminished.”

[Printed, 3d. No drawings.]

A.D. 1858, July 6.—N° 1518.

BUCHANAN, JOHN.—This invention “relates in part to an  
“ invention of ‘improvements in propelling vessels,’ for which  
“ Mr. John Buchanan obtained a grant of British Letters Patent,  
“ bearing date on or about the thirteenth day of September 1856 ;  
“ and it consists essentially in the use of a propelling wheel,  
“ drum, or disc of large diameter, and fitted with inclined or  
“ screw propelling blades, which wheel or drum is so disposed that  
“ its lower portion shall protrude through the bottom of the vessel  
“ or ship. This large wheel is placed right across the ship on a  
“ horizontal propelling shaft, running fore and aft, either in the  
“ line of the keel, or, as is preferred, at a slight horizontal angle  
“ with the keel ; this divergence from the keel line being for the  
“ purpose of enabling the force of the propelling blades to act  
“ right in the line of the keel.”

“The bottom of the ship is so formed as to allow of the free  
“ entrance to and discharge from the propelling blades protruding  
“ through, and this may be effected either by forming the bottom  
“ with double or reverse inclines,” or otherwise. “It is preferred  
“ to use as large a propelling wheel as the beam of the ship will  
“ allow of, and the sides of the ship may even be cut through or  
“ formed with projections to allow of recesses for the two oppo-  
“ site sides of the wheel.”

“The large wheel is covered in by a suitable transverse or  
“ athwart-ship case, and provision is made for the escape there-  
“ from of any water which may be elevated by the blades.”  
“The keel at the part of the ship where the wheel protrudes,  
“ may be depressed to allow of the propelling blades working  
“ above it, and this keel may either be sloped or brought upwards  
“ fore and aft, or it may be carried along at the increased depth  
“ throughout the entire length of the vessel. And instead of

" forming the bottoms of ships with troughs or submerged  
" chambers for the reception of screw propellers of moderate  
" diameter, as described in the specification of the Letters Patent  
" of 1856," a deep keel may be used, with the propeller working  
in a recess or depression in it.

[Printed, 7d. Drawings.]

A.D. 1858, July 9.—N<sup>o</sup> 1545.

**SIMONS, WILLIAM.**—This invention "comprehends various  
" improvements in and connected with ships or vessels, namely,  
" in their construction, in the arrangement or construction of  
" their masts and of parts connected therewith, in the mode of  
" mooring or anchoring them, and in the construction of boat and  
" anchor davits "

It consists, first, in arranging iron beams diagonally or obliquely, in the construction of ships; disposing the beams of one range in a direction opposite to that of the beams in the range immediately above or below it. On the top of each range of beams, and adjacent to the hatchways, two strong longitudinal iron plate stringers are to be worked, double rivetted throughout.

Secondly, in plating iron ships without the ordinary short internal butt straps; instead of which, a long plate or continuous butt strap of flat iron, of the same thickness as the outside plates, and of sufficient breadth for a butt strap, is to be bent round the outside of every alternate frame, or of every frame receiving the butts of the outside plates, or between the frames. Instead, however, of forming such butt frames of plates and angle iron, they may be rolled in the broad T form required.

Thirdly, in plating iron ships without any fillings between the frames and the outside plates. The vessel is to be first plated with the inside strakes, leaving their fore and aft or longitudinal seams, a comparatively narrow space apart or open, and this narrow space is to be filled up and covered with ribbed seam plates; these seam plates being long narrow iron plates rolled with a rib on their inner sides, which rib fits into the space between the lines of broad plates, and receives one or two rivets directly into each frame. These ribbed seam plates may be rolled in lengths of from twelve to forty feet, and will overlap several plate butts, whilst as they are of a double thickness in the middle, and form ranges of external clams or fenders bearing directly on the frames, their

use very greatly increases the strength of the vessel. A modification of this external seam plate may be used, being rolled without the rib, and being more or less rounded externally; but in using this modification, the fore-and-aft edges of the plates beneath must be brought close together. In place of a keel of the ordinary construction, a ribbed seam plate of extra thickness may be substituted.

Fourthly, in forming projections or knees on the upper edges of iron beams (whether common or diagonal) used in the construction of ships; for the purpose of obtaining increased strength, and of forming the waterway. Round these projections, angle iron is to be fastened, to which the top and front of the waterway are to be rivetted. The usual iron stringer and wooden waterway are thus superseded, or, if desired, the iron stringer may be rivetted in front of the iron waterway, under the deck, and on top of the beams. Projections or knees similar to these, and similarly plated, may also be formed on the under sides of iron deck or hold beams, and knees made as at present may or may not be retained.

Fifthly, in making the hold or 'tween deck stanchions, diagonal or inclined fore and aft, in place of being square from the keel. These stanchions may be in single lengths from the upper-deck beams to the keelson, or in two or more lengths; and in one range fore and aft, or in two ranges, the stanchions of one range intersecting or crossing those of the other; also in arranging athwart ship or transversely, in diagonal or inclined directions, iron hold or 'tween deck stanchions, either single or double, with or without bulkheads attached, and each in one or more lengths. This arrangement is of special advantage in steamers, preventing vibration; and in screw steamers clearing the screw shaft.

Sixthly, in forming keelsons of sufficient strength to fasten the lower extremities of the diagonal hold stanchions; and making the bottom of the ship stronger than usual, by causing as many as may be desired of the floorings to project up in one or more places, and in any convenient form, such as square, and then fixing round the edges of the projection, angle iron, to which is rivetted a plate keelson, consisting of plates of long lengths, on the top and sides. This portion of the invention is applicable to all keelsons, whether main, bilge, or sister keelsons, and also to engine and boiler seats.

Seventhly, in making the housing of topmasts, in the interior of the iron lower masts, in place of outside. The topmast is struck by being lowered inside the lower mast.

Eighthly, in forming winch ends, geared winches, or other purchases, in iron masts, having their spindles through one or both sides of the iron masts. "I also place double or single wheel  
" gearing inside iron masts; I also place a vessel's pumps inside  
" an iron mast or the tank pump, or I make the mast itself the  
" pump, or form the mast into a passage down to the hold, screw  
" shaft, chain locker, or 'tween decks, by placing a manhole door  
" in it at an accessible part of the mast above deck. I place in-  
" side a large iron mast a steam boiler, communicating with a  
" small engine either outside or inside, for warping, hauling, lift-  
" ing, or other purposes. I also make the interior of an iron mast  
" to answer as a trunk, through which to lead a telegraphic wire  
" communicating with the sea, and for the purpose of laying  
" down submarine telegraphs; for this purpose a hole is left in  
" the vessel's bottom, to which the lower end of the iron mast is  
" secured water-tight. I also make an iron mast, fixed as last  
" described, to act as a passage, through which to admit sea-water  
" into the vessel either for ballast, for the extinction of fire, or  
" for any other purpose. I also make such an iron mast to re-  
" ceive any or all a steam vessel's engine or boiler pipes requiring  
" communication with the sea, in which case the sides and bot-  
" tom of the steam vessel will not require to be perforated and  
" weakened in various places as at present. I also make such an  
" iron mast to receive any discharge pipes, refuse pipes, water-  
" closet pipes, head and stern pump pipes, bath pipes, wash deck  
" pipes, and pumps, tank pipes, scuppers, or any other pipes or  
" apparatus requiring communication with the sea water. I also  
" make the interior of my iron mast a trunk, through which to  
" lead standing or running wire or hemp rigging; also a hatch  
" trunk to communicate with the lower hold, which by this  
" means can be discharged or loaded without opening any of the  
" hatches, and for this purpose I step it on the lower deck, which  
" may be made water-tight throughout."

Ninthly, in fastening the wood ceilings of iron ships "without  
" requiring reverse angle iron on the frames, screw bolts, or nuts,  
" in the following way:—I bolt the ceiling to the inside edge of  
" the angle iron frames with clip bolts, or clasp bolts, which grip

“ both sides of the flange of the angle iron frame with sufficient  
“ hold to keep the ceiling plank in contact ; ” to make a better  
hold for the clip bolt, the frame angle iron may be rolled with a  
greater thickness at the inside edge, thus forming a dovetail.

Tenthly, in making boat and anchor davits, and any other  
davits, of T-iron, rolled with round edges.

Eleventhly, in employing wire ropes or cables, in place of chain  
cables, or in conjunction therewith, for mooring ships or vessels.  
The hawse pipes for such wire cables may be fitted with antifric-  
tion rollers, or they may be made of a metal occasioning less  
friction than iron. The windlass, winch, or capstan, may be fitted  
with a brake to regulate the veering out of the wire cable, and  
when the wire cable is on board it can be wound upon a drum  
placed on, or under the deck.

Twelfthly, in introducing the engines and boilers into a steam  
ship or vessel, through a gap left in the side of the vessel for that  
purpose, greased ways, wheels, or rollers being employed in getting  
in the engines and boilers, whilst lifting cranes are dispensed  
with.

[Printed, 1s. 3d. Drawings.]

A.D. 1858, July 12.—N° 1561.

MENNONS, MARC ANTOINE FRANÇOIS,—(*a communication.  
Provisional protection only.*)—An apparatus for stopping leaks  
in ships. “The apparatus consists of a double coil of strong  
“ waterproof tissue, or of metallic gauze rendered impermeable  
“ by known processes, which coil, being suspended to the sides of  
“ the vessel, is unrolled when required by means of lines worked  
“ from the deck. The tissue thus unrolled forms an impermeable  
“ envelope or casing to the hull of the ship, the pressure of the  
“ water causing it to adhere with the greatest tenacity to the  
“ leaks, which may then in most cases be repaired from within  
“ with comparative facility.”

[Printed, 3d. No drawings.]

A.D. 1858, July 15.—N° 1601.

NEWTON, WILLIAM EDWARD,—(*a communication from  
François Tovo. Provisional protection only.*)—“An improved  
“ mode of giving alarm in cases of fire in houses, ships, or other

"buildings." The invention consists "in the employment of a  
 "number of threads or cords composed of some combustible  
 "substance, leading from the place or places where a fire is likely  
 "to take place or laid upon objects which, during a fire, would  
 "be the first to take fire; and these threads or cords becoming  
 "ignited on the first outbreak of the fire, it will be communicated  
 "almost instantaneously to one or more small grenades placed  
 "either under the flooring or in any other part of one or more  
 "chambers situated in any suitable part of the building where  
 "the grenades would explode without danger, and thereby im-  
 "mediately give the alarm. Besides these small grenades inside  
 "the building the combustible threads or cords might be made  
 "to communicate with larger grenades, or with a Bengal light,  
 "or some other audible or visible and luminous signal situate  
 "outside."

[Printed, 3d. No drawings.]

A.D. 1858, July 22.—No 1651.

WARDER, DAVID WILLIAM. "Improvements in the manu-  
 "facture of beams, girders, ships' ribs or frames, and other  
 "structures of wrought iron."

The invention consists "in forming malleable iron beams,  
 "girders, bars, ships' frames or ribs in such a manner as to give  
 "them the appearance, form, strength, lightness, rigidity, and  
 "durability of the same when formed in one piece by the rolling  
 "mill. To effect this, I construct or build up my beam, or  
 "girder, or frame in two or more pieces, as the case may be, each  
 "part being rolled of the form I require. I then temporarily  
 "bind the several parts together, and unite them one to the other  
 "by welding them in the direction of their length, forming  
 "a beam the same as if produced from the rolls. I am thus  
 "enabled to make beams, or girders, or frames in one piece of  
 "much larger dimensions than can ever be produced by rolling  
 "mills, while at the same time I can, by preparing and combining  
 "the various parts, and uniting them by the method just stated,  
 "dispose the material in the beam in a far more advantageous  
 "manner than can in general be effected by the method of  
 "rivetting."

[Printed, 7d. Drawings.]

A.D. 1858, July 26.—N° 1674.

**ADAMSON, DANIEL.**—The invention consists in an improved mode of constructing hydraulic lifting jacks; and also in the application of hydraulic power for rivetting ships' boilers, tanks, and similar articles, during the process of building or making.

“ In constructing the apparatus for rivetting by hydraulic power, a power ram and a pump are employed, or two pump rams, a larger pump ram to quicken the action of the rivetting ram before great force is required upon it.” The pump ram and valves may be placed in the power or rivetting ram, or they may be placed at right angles to each other. “ A suitable pass valve is employed to discharge the water, oil, or other fluid from the power ram to the reserve cistern, ready to be used over again. The power or rivetting ram is to be brought back into the starting position by a lever or spring, or other suitable means.”

[Printed, 10d. Drawings.]

A.D. 1858, July 27.—N° 1690.

**SCOTT, JOHN.**—“ Improvements in pumps, which improvements are also applicable for the propulsion of ships, vessels, and boats.” The invention relates “ to the pumping or forcing of liquids for various purposes by the agency of a rotatory helical coil of piping or tubes. This coil of piping or tubing is arranged upon a globular vessel or supporting surface, having liberty to revolve upon a horizontal axis, and by reason of the globular or spherical form of the carrying surface of the coil of piping, the coils at the centre of the globe are the greatest in diameter, whilst those at the two ends are the smallest, the diminution or taper being gradual from the centre towards each end, where the piping is joined to stationary communicating pipes by suitable stuffing boxes. These two ends of the coiled pipe are each connected with a duplex branch pipe, two branches passing downwards to a suction or lift pipe, and two upwards to the forcing or elevating pipe. With this arrangement, as the apparatus is caused to revolve either continuously or with a reciprocatory action, the water or liquid to be raised or forced is drawn up from the reservoir or source of supply, and forced or along the upper lift pipe to wherever it is required.”

The coil of pipe is fitted at each end where the junctions with the branches occur, with a pair of valves opening upwards for the admission and discharge of the liquid." "The apparatus may be employed for raising or forcing various fluids or liquids, and it may also be used as a marine propeller for propelling vessels, by ejecting the water on the reaction principle."

[Printed, 8d. Drawings.]

A.D. 1858, August 7.—N<sup>o</sup> 1796.

LOCK, GEORGE PEARCE. — (*Provisional protection only.*)—"Improvements in the composition of paints for coating iron ships, and for other useful purposes." "The object of my invention is to preserve and prevent that part of ships and other vessels under water from fouling. To accomplish this I take for the under coating, of iron ore ground in boiled linseed oil about fifty per cent., and of oil and turpentine about fifty per cent., well mixed; for the outer coatings, of white lead about forty per cent., of blue mineral or copperas about ten per cent., and of oil and turpentine about fifty per cent., also well mixed together."

[Printed, 3d. No drawings.]

A.D. 1858, August 9.—N<sup>o</sup> 1808.

MURPHY, JOSEPH JOHN. — (*Provisional protection only.*)—"Improvements in the construction of floating bodies, and in the means of supporting floating structures." "The object of this invention is to enable a floating structure, or a structure erected on a floating foundation, to maintain a vertical or nearly vertical position when placed in a tide way or surf, or where otherwise subject to the action of the waves, and therefore be fitted for the erection of floating batteries, lighthouses, beacons, and other constructions or works. It consists of one or more inverted air-tight vessels somewhat like a gasholder, of such a height or depth as shall allow of a permanent air space being maintained, and by which the action of the waves, or the alterations of the level of the water externally, shall be permitted freely to communicate and operate within the said inverted vessel, and thus counteract the rolling and oscillating motion, or tendency to motion, which otherwise exists in bodies im-

“mersed in or floating freely in a sea way.” The vessel to be circular in plan, and to be built of iron, or other suitable metal. Watertight chambers are to be formed in the upper part of it, and means are to be provided for forcing air into the inverted vessel as it may be required.

[Printed, 8d. No drawings.]

A.D. 1858, September 3.—N<sup>o</sup> 1998.

ROBERTSON, JAMES.—“Improvements in driving belts and “springs.” This invention relates to “the application and “adaptation of corrugated, undulated, or indented plate or sheet “metal to the construction of driving belts and springs, and has “for object the obtainment of economy, efficiency, and various “other advantages.” “Corrugated, undulated, or indented “metal plates or sheets may be arranged to act as springs in “various ways. In all the modifications of such springs com- “prehended in this invention, the spring or elastic action is “called into play by spreading out or elongating the corrugations, “undulations, or indentations, and exhibits itself in contracting “or tending to contract them to their original forms. This “spreading out or elongation may result from a tensional or “pulling strain applied to the spring, or from a compressing “strain applied so as to tend to reduce the depth of the corru- “gations, and the various modifications of the improved springs “may be divided into two classes accordingly,” viz. “tension” springs, and “compression” springs. Compression springs may consist of several corrugated plates alternated with flat plates, or of corrugated plates alone, arranged with the corrugations coinciding with, or crossing each other. These plates may sometimes be round to form “washer” springs, and the corrugations may be disposed radially. Compression springs may be advantageously adopted, in connecting pieces generally united in a solid or rigid manner, but in which a slight elasticity or yielding power may be considered desirable. As an example, springs may be applied in this way to the masts and other spars of boats and ships. Springs composed of a number of corrugated steel sheets may also be thus applied to the sides of a war ship, for preventing the usual damage arising from projectiles. This is one example of the application of the corrugated spring plate.

protective purposes, but there are many other cases in which a similar use may be made of them.

No application of "tension" springs to ship-building purposes is mentioned.

[Printed, 2s. Drawings.]

A.D. 1858, September 7.—N° 2023.

**TUCKER, WILLIAM.**—"An unproved variable boring bit." The shank of the bit has two screw threads cut upon it, one in advance of the other, and cut in opposite directions, so that one is a right, and the other a left threaded screw. Before these two screw threads, and excentrically from them, is a tapering centre point, or screw centre. Upon the foremost of the two threads on the shank a cutter is screwed, which not being concentric with the centre point, may have the distance between the centre point and the extremity of its cutting edge varied, by turning it round upon the shank. A nut upon the hinder thread, forms a means of clamping this cutter in any desired position. An auxiliary cutter is formed on the bottom of the shank, with which the main cutter may be brought end to end, so as to form with it one cutting edge.

[Printed, 6d. Drawings.]

A.D. 1858, September 8.—N° 2031.

**LAMB, ANDREW, and WHITE, JOHN.**—"This invention relates to certain improvements in the construction of life boats."

Life boats are constructed with longitudinal water-tight compartments, built on each side of the boat, extending nearly from stem to stern, and carried up to the gunwale; and with water-tight compartments at the head and stern. Two or more vertical delivery tubes, fitted with valves, pass through the bottom of the boat, and are so constructed as to prevent the admission of water from without, and to free the boat from any water within which is above the level of the water outside. These tubes are to be so placed with reference to the calculated centres of gravity and displacement of the boat, as to make the boat available for carrying out the largest anchor from the ship, the anchor being slung under the bottom of the boat, the slings passing through the tubes.

Should the boat, under these circumstances, ship a sea, there will

be sufficient buoyancy in the air-tight compartments to carry the anchor and crew with safety, whilst an ordinary boat would be buried by the waves, and would consequently sink. These tubes will also admit air, should such a contingency as the boat's capsizing occur, and the crew be confined underneath. They would in that case be safe, there being sufficient head room for them between the thwarts and the bottom. Water plugs are to be fitted at the lower part of the air cases, and screw plugs at the top, by which means a free current of air may be passed through the cases, and their durability will be ensured.

[Printed, 10d. Drawings.]

A.D. 1858, September 9.—N° 2039.

LUIS, JOZÉ,—(*a communication. Provisional protection only.*)  
—“An improved life preserver raft.” This invention is specially intended for application to waterproof duck-cotton mattresses, which are stuffed with cork shavings, such mattresses being very comfortable as a bed, and also very buoyant when in water. The improvement consists in providing such mattresses with straps and buckles on their upper and under surfaces, and with loops round their edges. By this arrangement, in cases of emergency, a series of mattresses can be buckled together; and a life preserving raft may be formed, by placing several layers or tiers of the mattresses buckled together on the top of one another, in such a manner as to form angular break joints, the said layers or tiers being so buckled and strapped together that it will be impossible for the tiers to separate or change their position, either longitudinally or laterally.

[Printed, 3d. No drawings.]

A.D. 1858, September 11.—N° 2061.

HILL, LAURENCE.—“The invention consists of an improved  
“ construction of the windlass purchase or capstan used in ships  
“ or other vessels, whereby greater facility and safety are obtained  
“ in giving out chain or cable. To effect this I construct the  
“ frame of the windlass, purchase, or capstan in any of the usual  
“ ways, and communicate the working power to the main axle or  
“ shaft in any of the usual modes. Instead, however, of placing  
“ the chain barrels (round which the chain or cable is passed or

" wound, inside of or between the outer bearings or purchase  
 " bits, and fixing the same firmly to the axle, I place the chain  
 " barrels outside of the bearings, and bore them out so that they  
 " may run loose on the axle. The chain barrel may be of any of  
 " the usual descriptions, but I prefer one formed with a groove  
 " and projecting parts suited to the size of the chain or cable.  
 " To the chain barrel I fix and unite a strong friction wheel or brake  
 " (either by casting both in one piece or otherwise), so that the  
 " chain barrel and friction wheel may be capable of revolving  
 " freely together on the axle when so desired. On each of the  
 " outer ends of the axle I place and firmly fix a purchase end,  
 " which I prefer to be whelped, and round which chains or ropes  
 " can be passed or wound when required. This purchase end  
 " also serves as a collar to prevent the chain barrel and friction  
 " wheel from coming off. By one or more suitable stop bolts  
 " capable of being projected through the purchase end into suit-  
 " able holes in the chain barrel and friction wheel, I provide  
 " means of fixing or locking the chain barrel and friction wheel  
 " to, and causing them to revolve with, the axle, for the purpose  
 " of heaving in the chain or cable; and by drawing back these  
 " stop bolts, the chain barrel and friction wheel will again revolve  
 " freely on the axle, so as to give out chain under the regulation,  
 " when desired, of a brake or friction strap."

[Printed, &c. Drawings.]

A.D. 1858, September 14.—N<sup>o</sup> 2079.

**REDPATH, CHRISTOPHER JAMES.**—This invention refers to  
 " improvements on the invention of ships, and other pumps for  
 " which Letters Patent were granted to George Wilkinson, bear-  
 " ing date the Fourth day of March, in the year of our Lord, 1852,  
 " and consists in the application of horizontal instead of the  
 " vertical barrels hitherto used for working the plungers of such  
 " pumps, whereby two or more valve barrels may be operated by  
 " a single plunger." The horizontal plunger barrels may be  
 placed so as to use two or more of such barrels without the addi-  
 tion of valve barrels. The improvements embrace lift, force, and  
 other pumps.

[Printed, &c. Drawings.]

A.D. 1858, September 16.—N° 2094.

DUKE, JAMES. — (*Provisional protection refused.*)—"Improvements in life-boats, which improvements are applicable to other boats." "My improvements in boats are of such a nature that all the water shipped by a boat, even to the extent of her utmost capacity, will be discharged in a few seconds, without the use of plugs, valves, floating cavities, or other such contrivances dangerous to the safety of the boat; she is likewise so constructed that she cannot upset, having two fore & aft spaces or cavities into which the external water has access by channels through the bottom of the boat; this enclosed body of water acts as ballast and prevents the possibility of capsizing. The water shipped by the boat finds passage through suitable channels into the cavities or spaces before mentioned, and thence into the sea by the openings of communication therewith. I construct my improved boats with external & internal bodies, applying to one or both bodies a peculiar arrangement of double planking, which renders them light & strong, with a saving in cost & material, and being formed somewhat on the lines of the boat known as the gig they are easily manageable in boisterous weather, or in a heavy sea."

[Printed, 3d. No drawings.]

A.D. 1858, September 18.—N° 2107.

ALLEYNE, JOHN GAY NEWTON. — "Improvements in the manufacture of wrought-iron beams and girders." This invention consists in making wrought-iron beams and girders "in two or more pieces united by scarfed or notched or lapped or diagonal joints; thus I roll two pieces of wrought iron, each of which has a flange or enlargement at one edge, and has its other edge bent or formed in such a manner as to fit to the corresponding edge of the other piece of iron; the aforesaid flanges or enlargements may be on one or both sides of the edge. I place the two pieces together, and connect them by one or more rows of rivets or bolts and nuts, or by other suitable means; I prefer to make the forms of the adjoining parts such that when united the vertical part of one piece is exactly over the vertical part of the other."

No. 19.

“ the other piece, or nearly so. In some cases I make one or  
 “ both pieces with a flange or bent portion at one side of the edge,  
 “ which is to be united to the other piece, which flange or bent  
 “ portion may be used for supporting joists or for other similar  
 “ purposes, and also adds to the lateral stiffness of the beam or  
 “ girder. In some cases when very deep girders or beams are  
 “ required I introduce one or more intermediate bars or plates  
 “ having their edges rolled to correspond with the top and  
 “ bottom pieces to which they are rivetted.”

[Printed, 10d. Drawings.]

A.D. 1858, September 30.—N<sup>o</sup> 2181.

**NORMAND, AUGUSTIN.** This invention has for its object to provide a means of closing the well hole of screw steam vessels, whether the screw be working or not, and at whatever depth the well hole may be situated below the water line, in such manner that the surface of that part of the stern of the vessel may be unbroken. “To carry out this improvement, first, I give to the  
 “ part of the stern comprised between the two stern posts on each  
 “ side of the central plan of the vessel, and on a proper extent, a  
 “ segmental form, either convex or concave, in cross section, or a  
 “ plane surface, whichever will best suit the shape of the stern of  
 “ the ship. Secondly, I close the bottom opening of the well hole  
 “ by sliding lateral doors or shutters (of wood, or metal, or both),  
 “ taking the form of the outside of the vessel, and moveable either  
 “ from within or from the deck of the vessel, so as to recede or  
 “ approach each other. If thought desirable, the sliding doors  
 “ may be divided into several parts, and either worked altogether  
 “ or separately. They may be opened or closed by means of  
 “ endless chains, racks and pinions, screws, or any other means  
 “ found most suitable, according to the size, form, and arrange-  
 “ ment of the vessel to which they are fitted. I also propose to  
 “ alter the usual shape of the opening of the well hole, making it  
 “ follow the profile figure of the screw when viewed from above,  
 “ the screw being turned to bring the central part of its blades into  
 “ a vertical line, which is the position it will be required to take  
 “ when it is raised or lowered. This novel arrangement has the  
 “ advantage of reducing, as far as is practicable, the internal sum

“ of the well hole, and consequently the surface which the sliding  
 “ doors have to cover, and to give a greater length to the guides  
 “ for the shutters.”

[Printed, 1s. 4d. Drawings.]

A.D. 1858, October 4.—N<sup>o</sup> 2205.

**TREVITHICK, FRANCIS.**—This invention has for its object improvements in applying sails and keels to boats and vessels.  
 “ For these purposes I construct the sails of ships or vessels of  
 “ strips or narrow bands of thin sheet metal, which I combine  
 “ together by means of chains or wire ropes stretched between  
 “ yards or booms, and for fore-and-aft sails the strips or narrow  
 “ bands of sheet metal may be arranged in an upright position,  
 “ and connected by means of chains or wire ropes so as to wind  
 “ round a revolving mast. In applying keels to boats or vessels  
 “ fixed tubes are used at intervals, parallel with the centre or keel  
 “ of flat-bottomed boats or vessels; through these tubes chains or  
 “ cords are passed, to which the keels are attached, and other cords  
 “ or chains pass over the sides of the vessels, which are also  
 “ attached to the keels, and by which the keels may be lifted into  
 “ the vessel or be brought to act as lee boards.”

[Printed, 9d. Drawings.]

A.D. 1858, October 9.—N<sup>o</sup> 2249.

**BULL, CHARLES EDWARD.**—(*Provisional protection only.*)—  
 “ An apparatus for containing and preserving articles of value  
 “ from loss or damage in cases of shipwreck.” This consists of a  
 rectangular metal box with an inner and outer lid. The interior  
 of the box is lined with cork on the bottom and sides, that on the  
 sides coming within about two inches of the top. “ I fasten the  
 “ cork to the tin with tin straps, (four or five on each side and at the  
 “ bottom,) strongly soldered to the box, which are brought through  
 “ the cork and then clenched.” Upon the upper edge of the cork,  
 along the four sides of the box, is fixed a metal flange, which is  
 strongly soldered to the sides. On the under side of the inner lid  
 there is a band of vulcanized caoutchouc, so that when the lid or  
 covering is put over the inner part of the box, the caoutchouc rests  
 upon the edge of the flange, and when the lid is pressed on the  
 flange, by means of iron bars set tight by thumbscrews, the box

is rendered impervious to water. The outer lid is convenient, but not essential, for without it the box is perfect; when the lid is shut, the box resembles the usual receptacle for papers in a solicitor's office.

[Printed, 8d. Drawings.]

A.D. 1858, October 9.—N<sup>o</sup> 2253.

PASCOE, JAMES BRAY, and THOMAS, JOHN ROBERTS.—*(Provisional protection only)*—"Improvements in condensing and gassing smoke, which are applicable also to forcing and drawing water, propelling ships, and drawing and forcing air, to be worked with animal, water, steam, or air power." "These improvements in condensing and gassing smoke, applicable also to propelling ships, &c.," consist "in drawing the air and smoke from any given distance to any given point, passing it through the machine, turning it into gas or into water; if into water, we intend to use it as manure. In propelling ships, we take the water from the bows of the vessel, pass it through the machine, and discharge it at the stern in as large a column as may be required for any purpose, which column will act as a fulcrum by which we can gain speed."

[Printed, 7d. Drawings.]

A.D. 1858, October 12.—N<sup>o</sup> 2274.

BEADON, GEORGE.—"Improvements in the construction of ships, boats, rafts, and vessels for passing through water or through the atmosphere, or partly through the water and partly through the atmosphere." This invention consists, first, in "the construction of ships, boats, rafts, and other vessels with an outer jacket or casing surrounding them, and open at the extremities, or with double sides, with space between large enough to admit the wave or flow of the water or air displaced by the forward or progressing end of a body in motion, or its bow propeller, and to pass freely to the after or stern end thereof, and to fill the space vacated by the receding end or stern end, so that the sucking created by the partial vacuum at the stern will be counteracted, as also the resisting tail water, and so that the flow or wave created by a bow propeller when revolving, or by the bow when sailing or steaming, will pass freely into this casing at

“ the fore end, and be relieved thereby from the superincumbent  
“ pressure of the fluid medium by which the vessel is supported,  
“ which will be little if at all agitated thereby.”

Secondly, “in casting or otherwise forming the lower parts of  
“ vessels, including my conical bow, patented 21st December  
“ 1852, in sections, or parts in moulds, and putting the same  
“ together by lap joints, bolts, and nuts.”

Thirdly, of “a boom or tail propeller, for the purpose of steering  
“ and propelling, and by its action keeping back the wake water  
“ from following the vessel.”

Fourthly, in constructing vessels “with turn-tables, for receiv-  
“ ing masts with fixed yards, and I work the same by gear work  
“ instead of by braces, and haul the sails out laterally instead of  
“ vertically.”

Fifthly, in constructing “my tubular bottomed vessels, patented  
“ 21st December 1852, with a movable crane or derrick, which I  
“ raise or lower between the sides or tubular bottom, so as to pro-  
“ ject below the vessel, to prevent the cable from injuring my  
“ conical bows or spiral propellers thereon when the vessel is at  
“ anchor.”

Sixthly, in constructing “tubular vessels with conical bows,  
“ according to my patent aforesaid, for sailing with one extremity  
“ and steaming with the other extremity, or for sailing and  
“ steaming with either end, as the case may be.”

Seventhly, in constructing “tubular bottomed vessels with  
“ openings at the sides, above or upon pillars standing upon the  
“ tubular bottomed vessels, so that the waves may break through  
“ laterally.”

[Printed, 10d. Drawings.]

A.D. 1858, October 12.—N<sup>o</sup> 2276.

CUTHBERTSON, HENRY WILLIAM, and CUTHBERTSON,  
GEORGE. — (*Provisional protection only.*) — “Improvements in  
“ lever purchases for ships’ windlasses, pumps, and other similar  
“ purposes.” This invention consists of an arrangement by  
means of which heavy weights can be raised, and greater power  
applied to ships’ pumps, windlasses, &c., in a more efficient manner  
than heretofore. In this arrangement “we employ two short hori-  
“ zontal shafts, one above the other, the ends whereof work in

“ suitable bearings mounted on the top of the ‘pall-bit;’ on and  
 “ about the centre of these shafts are placed two pinions working  
 “ one in the other; and by the side of these pinions are fixed  
 “ also on the shafts, two crossheads, that on the upper shaft is  
 “ hollow for the insertion of the lever handles, the lower one  
 “ being solid and jointed or pinned at each end on to two vertical  
 “ connecting rods by the side of the ‘pall-bit.’ Thus it will  
 “ appear that as the power is applied to the handle and raised at  
 “ one end, the reverse end of the lower crosshead is also raised,  
 “ and vice versa; by this means we are enabled to increase the  
 “ power four or five times more than by lever purchases heretofore  
 “ used.”

[Printed, 3d. No drawings.]

A.D. 1858, October 14. N° 2298.

NEWTON, WILLIAM EDWARD, (*a communication*)—The object of this invention is the construction of air-tight cabins or state rooms for steamboats or other vessels, and which cabins or state rooms are so arranged and adapted to the vessels, that they shall, in the event of the hull of the boat or vessel sinking, be capable of automatically detaching themselves therefrom, and of floating on the surface of the water; and when so detached and floating, shall be under the control, to a certain extent, of the occupants; and also shall afford ventilation, food, water, and light to them during the period they may be out at sea. In carrying out this invention, the cabins or state rooms are by preference made of a cylindrical form, with conical ends, and are fitted to a framing that is secured to the ship. The conical ends of the cabin are provided with vertical grooves or flanges, that are adapted to corresponding vertical grooves or flanges, fixed to stationary framing; and the several parts are so arranged that the cabin or state room will be capable of moving or rising vertically out of the grooves, whereby it is attached to the fixed framing. Inside the cabin are couches or seats, and at the lower part, are water-tight vessels or compartments to contain fresh water and a store of provisions. Means are provided for securing light and ventilation, and also, by the use of oars and rudders, for propelling and steering.

[Printed, 10d. Drawings.]

A.D. 1858, November 6.—N° 2483.

**JONAS, BENJAMIN WOOLF, and JONES, REUBEN.**—(*Provisional protection only.*)—An improved ship's block. This invention, which has for its object "to improve the present form  
" and construction of ships' blocks, with the view to increase or  
" diminish the strain upon the rope, cable, or otherwise as may  
" be required, consists of an outer sheave or block furnished with  
" a channel, in which two or more pulley wheels are so arranged  
" as to admit of the rope, cable, or otherwise impinging upon  
" the peripheries in such manner as to increase or diminish the  
" space between the same through the medium of a concentric  
" slot bearing, in which one of the lesser wheels revolves, the  
" larger or fixed wheel moving from a common centre, as heretofore."

[Printed, 3d. No drawings.]

A.D. 1858, November 9.—N° 2507.

**HENDERSON, ANDREW.**—This invention has for its object  
" improvements in vessels and in applying rudders thereto, and  
" the improvements are peculiarly applicable to tug or tow boats  
" or vessels used in shallow waters, in tortuous channels, and in  
" cross currents. For these purposes at the bow and also at the  
" stern end of the vessel, a chamber is formed so that a rudder  
" may be raised into it. The rudder at the fore end or bow of  
" the vessel is mounted on a spindle which moves in suitable  
" bearings, and the spindle has formed on it a male screw on  
" which there is applied a nut, which rests upon one of the  
" bearings of the spindle, and by turning this nut the spindle  
" may be raised or lowered, and the position of the rudder adjusted, and the rudder in the event of touching the bottom is  
" capable of rising into the chamber. The stern or hinder rudder  
" is similarly mounted on a spindle having a screw thereon, and  
" a screw nut to adjust the position of the rudder. The spindle  
" is sustained by a bearing which is mounted on necks or axes,  
" by which the spindle may assume an inclined position, and the  
" parts of the spindle above and below such bearing are supported  
" on either side by parallel guides. The spindles or posts are not  
" fixed to the forward edges of the rudders, but are fixed to the

“ rudders so that the rudder in each case extends beyond the  
 “ spindle both forward and aft, and by preference the spindle is  
 “ fixed to its rudder in such manner as to have about one-third  
 “ of its length projecting forward beyond the spindle to which it  
 “ is fixed.”

[Printed, 8d. Drawings.]

A.D. 1858, November 11.—N° 2531.

MABERLY, FREDERICK HERBERT.—“ Improvements in the  
 “ construction of ships of war and other vessels, their machinery  
 “ and appurtenances.” “The form of the vessels to be con-  
 “ structed to be of a barrelled kind as much as possible, and  
 “ tapering towards each end, so as to have prows at the same;  
 “ the bottoms to be nearly flat, with double keel, their breadth  
 “ being in the ratio of one or two to three, their height being de-  
 “ termined by their form. The material to be of iron or wood,  
 “ or of any metal found more appropriate than iron. The plates  
 “ of iron (or other material) to be longitudinal ones, and each  
 “ plate a welded one throughout, and so formed that the edges  
 “ upper and lower will fit closely upon ” one “ another, and these  
 “ longitudinal plates to be united together by other and narrower  
 “ longitudinal plates breaking the joints of the former, and to  
 “ be rivetted, bolted, or screwed to them. The inner plates of  
 “ the vessel extending athwart the vessel to be of the like kind,  
 “ and joined together in the same way, and rivetted at right  
 “ angles to the outward plates.” “If the ship be a war one, I  
 “ propose it to be altogether a covered one with a top to lift up,  
 “ with the needful windows and air-holes in it to exclude the sea,  
 “ but not the light or air, and which ship would be nearly inde-  
 “ structible by any ordinary power.” It should also have a  
 “ martello tower erected on its deck.

Paddle propellers, and a certain arrangement of machinery  
 for driving them, are described, together with a regulator by  
 means of which one person on the deck may have the entire  
 control of the engine and of its several parts in his own  
 hand, by which means he can at pleasure stop the propellers  
 on one or both sides of the ship; he may also set the en-  
 gines to pump water out of the ship, or upon a fire, or to perform  
 both operations together. A rod or rods jointed or otherwise  
 connected with the regulator, and preceding the vessel, may be

made to stop or back the engines when they come in contact with any dangerous obstacle ahead.

Improvements in ordnance also are described; consisting in boring or otherwise forming a number of gun barrels, radially, in and upon a solid ring or sphere, which revolves either in a horizontal or a vertical plane, so as to bring the several barrels opposite the ports through which they are to be fired. Several of these rings may be set at intervals on a longitudinal axis, so that they may all be turned into position together. By the use of machinery for loading and firing these guns, the inventor considers that it is possible to fire a thousand shot in a minute.

“The machinery” of the proposed lifeboat “is similar to that of the war vessel itself, and thus may cast off from the ship into the sea, and the passengers afterwards admitted into it.” It is further proposed to use, for the purposes of plumbing or sounding, an arrangement of lazy tongs, worked partially by the engine.

The machinery of the pumps consists of “a small circular tubical wheel with an open mouth, by the whirling of which wheel” it takes in the water, and conveys it to an upright tube.

The life buoy is formed principally of the old corks of bottles, made into belts, something like those of the common life buoy. It is to be put on “by shoulder straps or attached to a vest to be put on thus, or to be sewn to a bell-mouthed watertight vest similar to a waistcoat and fasten in front.” Such buoys to have a provision for carrying meat and drink, and by a lengthened vest carrying a few spikes, to afford to the wearer a protection against the voracity of sharks.

[Printed, 1s. Drawings.]

A.D. 1858, November 16.—N<sup>o</sup> 2575.

PERRY, CHARLES JAMES CLOWES.—“An instrument to be used chiefly on board ship for approximating in certain cases the course of an approaching vessel either in the day or night, and the relative angle of both ships’ courses, in order to avoid a collision, to be called Perry’s anti-collision dial.”

The instrument consists of a compass card of peculiar construction. It is of a circular form, and about sixteen inches in

diameter. There are divisions upon it corresponding with the points of the compass, distances in miles, and intervals of time in seconds. The data employed in approximating to the course of an approaching ship, by means of this instrument, consist in two bearings of the vessel, or of the vessel's light, the estimated distance at each bearing; and the measured interval of time between them.

[Printed, 11d. Drawings.]

A.D. 1858, November 20.—N<sup>o</sup> 2640.

**JORDAN, HENRY.**—This invention relates to improvements in the construction of the hulls, masts, yards, and other spars; in the trusses, and portions of the standing rigging; and in an improved arrangement for the ventilation of navigable vessels.

“To construct the hull of an iron vessel according to my invention, I divide it longitudinally into two equal parts by a watertight midfeather or bulks-head, which runs fore and aft, and forms the keel, stem, stern post, and keelson, strengthening plates being placed on each side of the keel; and stringers of angle iron with the flanches turned up are secured on each side of the longitudinal bulks-head, opposite the upper and lower deck beams. The deck beams are placed in a diagonal direction, the upper and lower deck beams being placed in opposite directions, and are rivetted at one end to the angle iron and the midfeather, and at the other to stout plates which run round the ship for the purpose, and which also form the water ways. By this arrangement the deck beams are formed in two lengths, being divided amidships at the midfeather. In some cases I prefer not to carry up the midfeather above the lower deck,” and where it is considered desirable to dispense with the midfeather or a portion thereof, “I form a large box keelson with a midfeather running vertically up from the keel, and which also forms the keel, and divides the interior thereof into two chambers.”

“The vessel is constructed with a longitudinal frame forming buttock and bow lines, or ribbon lines to receive the laps of the plates, and to which they are rivetted. I also prefer to introduce two or more sister-box keelsons on each side of the midfeather, and running the whole length of the vessel, and an internal transverse framing formed of inverted T-shaped

“ iron is placed, say, from two to four feet apart, to receive the  
 “ ceiling, which is held in its place by small flanches formed on  
 “ each side of the centre rib of the T-iron.” If desired, the vessel  
 may be planked vertically or diagonally with wood, in place of  
 being plated with metal, in which case the longitudinal framing  
 is diagonally or vertically braced with flat iron straps or plates.  
 In constructing wooden vessels, iron or wood may be used in the  
 construction of the mid-feathers, and wood may be used to form  
 the longitudinal frame. It is proposed to substitute stout glass,  
 in suitable wood or metal framing, for one of the deck planks on  
 each side of the mid-feather.

The improvements in masts, yards, and other spars, relate to  
 those formed of tubular iron or steel, and consist in forming them  
 in suitable and convenient lengths, and attaching them together  
 by flanchéd or socket joints, or both, for convenience of stowage,  
 &c. By this arrangement one-half of a yard may be used as a  
 topmast, jib boom, or other spar. When the improved jointed  
 yards are carried as spare yards in ships with wooden masts, it is  
 proposed that they should be placed vertically on the fore part of  
 the lower masts, and used as ventilating shafts, by placing the  
 flange on the top of small combings on the deck, to which they  
 are secured by screw bolts through the flange. It is preferred to  
 form these improved spars of corrugated metal, for the sake of  
 strength.

“ My improved truss is formed of a straight bar of iron, steel,  
 “ or other metal, jointed to the mast, so that it has an horizontal  
 “ motion, and the outer end which is round is passed through a  
 “ hole in the centre of the yard, and upon which the yard can be  
 “ peaked or turned. There is a collar or shoulder on the truss  
 “ bar abutting against the after side of the yard to prevent  
 “ it falling in to the mast, and a loose collar and pin are fitted on  
 “ the fore side to prevent the yard being unshipped when in use.  
 “ When my improved truss is applied to double topsail yards, it  
 “ is formed with a supporting bracket, as the ordinary slings  
 “ cannot be applied to double topsail yards.”

“ My improvement in standing rigging consists in substituting  
 “ single straight bars of steel, ‘ puddled steel,’ or ‘ homogeneous  
 “ metal,’ in place of the hempen or wire rope now used for that  
 “ purpose.”

“ My improvements for the ventilation consist in introducing a

“ series of perforated pipes or tubes of wood or metal running  
 “ round the vessel below the deck beams, and in various direc-  
 “ tions over the ship and berths in troop or emigrant vessels;  
 “ these pipes are carried to and open out into the interior of  
 “ hollow masts, which masts below the cap are provided with  
 “ openings fitted with closing slides that may be worked from  
 “ the deck of the vessel ”

[Printed, 10d. Drawings.]

A.D. 1858, November 24.—N° 2664.

SHAW, Sir CHARLES.—(*Provisional protection only.*)—The in-  
 vention consists “ in constructing mantlets or shields of alternate  
 “ layers of wire netting or gauze, or metal cloth, or metal rods or  
 “ bars worked and tied together, and hair, leather, cotton waste,  
 “ tow, or other fibrous material.

“ When for the protection of ships, I arrange the metal bars or  
 “ other materials of which the shield is formed, in such manner  
 “ that when not required for the purpose of defence, they may  
 “ be readily removed and stowed in-board.”

[Printed, 5d. No drawings.]

A.D. 1858, November 25.—N° 2671.

AMOS, CHARLES EDWARDS.—(*Letters Patent void for want of  
 final specification*)—“ Improved apparatus for raising and sup-  
 “ porting ships or vessels while undergoing repair, which appa-  
 “ ratus is also applicable for facilitating the passage of ships or  
 “ vessels over bars, sandbanks, or in shallow waters.” The un-  
 proved apparatus “ is composed of a number of tanks or vessels  
 “ like ships’ water tanks, which, when combined and properly  
 “ secured together, may be filled with water, and sunk under  
 “ the vessel, then by pumping air into these tanks or vessels the  
 “ water will be expelled therefrom, and the tanks or vessels will be-  
 “ come buoyant, and will gradually raise the ship out of the water.”  
 Instead of a number of small tanks or vessels combined or con-  
 nected together, two or more large air-tight tanks or vessels of  
 suitable dimensions may be constructed, and divided into com-  
 partments. These tanks or vessels must be firmly secured together,  
 so as to form, as it were a rigid girder or framing, upon which

is to be fixed a cradle or other contrivance, to support the ship or vessel when raised out of the water.

[Printed, 3d. No drawings.]

A.D. 1858, November 27.—N° 2699.

KINNEAR, FREDERICK CONSTANTINE, and POSENER, DAVID.—(*Provisional protection only.*)—"Improvement in the means of preserving life and property in navigation." This invention consists in the attachment of inflated air-tight tubes or bags, made in one or more compartments or divisions, to the internal or external sides of ships or vessels and floating craft of all kinds, whereby the buoyancy of such ships or vessels and craft is so increased, that the possibility of their sinking or foundering is prevented. "We do not confine ourselves to any material in the construction of our air-tight tubes or bags, but we prefer to use that known as double texture, or Mackintosh cloth. These tubes or bags may be inflated either with gas or atmospheric air, and are attached or applied to the sides of the craft in any convenient manner."

[Printed, 3d. No drawings.]

A.D. 1858, November 29.—N° 2721.

GRESHAM, JOHN.—This invention has for its object improvements in apparatus for preserving ship's papers, and other papers and writings, in the event of the sudden loss of a ship by wreck, fire, or other accident, whilst at sea. For this purpose, "I should construct the buoy to be called 'the Gresham record buoy,' of glass, metal, or other suitable material." It is preferred that its shape should be spherical. If made of metal, it should have the outside under water protected with enamel, and if of glass, the internal surface above water should be lined with bright metal or otherwise, so as to render it capable of reflecting the rays of light. At the top of the buoy, a rod may be fixed rising to a slight elevation, with a coloured flag or signal attached, and lower down the rod may be suspended a bell, for the purpose of using every available means of attracting attention. In the interior of the buoy there should be a water-tight compartment, large enough to contain the log-book and other papers, and capable, in case of leakage in the outer shell of the buoy, of pre-

venting its entirely sinking; the opening into this compartment and the buoy, to be rendered impervious to the penetration of the water, by a close-fitting lid. The space in the interior of the buoy, between the water-tight compartment and the outer shell of the buoy, to be filled with cork shavings or other matter of like specific gravity.

[Printed, 8d. Drawings.]

A.D. 1858, December 11.—N° 2844.

**HINKS, JAMES** —(*Provisional protection only*) — "Improve-  
ments in ships' and other lamps." The invention consists,  
" firstly, in the following method of constructing the chimney of  
" the lamp. I make the said chimney of a slightly tapering  
" tubular form, and at its summit place a chamber, the figure of  
" which somewhat resembles two very obtuse cones placed base  
" to base. The chimney opens into the said chamber, the upper  
" end of the chimney being expanded so as to have the figure of  
" a trumpet mouth, and nearly corresponding in shape with the  
" lower half of the chamber into which it opens. In the upper  
" part of the chimney a horizontal diaphragm is placed, the said  
" diaphragm being perforated with holes. The lower side of the  
" chamber into which the chimney opens is also perforated to  
" permit of the escape of the current of heated air from the lamp.  
" By the construction described, the burning of the lamp is un-  
" affected by strong winds blowing upon it or by water dashed  
" upon it."

Secondly, " in making the reflectors of ships' lamps and lamps  
" enclosed in cases of a series of planes arranged round the flame  
" so as to be perpendicular or nearly so to radii drawn from the  
" flame; that is to say, instead of making the said reflectors of a  
" piece of plated metal bent into a concave form, I make the  
" reflectors with a series of obtuse angles, alternating with plane  
" surfaces, the general figure of the reflector being concave like  
" ordinary reflectors."

[Printed, 3d. No drawings.]

A.D. 1858, December 15.—N° 2876.

**WARDILL, JONATHAN.** The invention consists " in con-  
" structing a stopper or controller with hinged jaws, one being

“ hinged to each side of a bed, along which the chain or rope  
 “ runs, and which jaws, by means of a screw, lever, or other  
 “ suitable power applied at or near the upper part thereof, are  
 “ made to press down upon, grip, and entirely or partially stop  
 “ the passage of the chain or rope.”

[Printed, 6d. Drawings.]

A.D. 1858, December 22.—Nº 2928.

**SHULDHAM, MOLYNEUX.** — (*Provisional protection only.*) —

The invention consists “ in methods of running in or hoisting up  
 “ a ship’s bowsprit, with its jibboom and flying jibboom, so as to  
 “ enable any of Her Majesty’s ships, or any other vessels, when  
 “ constructed as steam rams (which require bowsprits), to enable  
 “ them to carry sufficient head sails, and notwithstanding to be  
 “ in a fit state to perform the duty of steam rams.”

The first arrangement is for housing the bowsprit by means of an inverted railway; the rail is fixed to the bowsprit, and the rail wheels are fixtures in the interior of the vessel, of a sufficient number to bear the weight of the bowsprit throughout the line of its course, the inclination of the rail to the plane of floatation sufficing to allow the bowsprit to run down by its own gravity, a certain description of brake being provided, to modify any accelerated motion caused by the vessel’s pitching. All the rigging and gear of the bowsprit and jibbooms are contrived to slip off, as they run in.

According to the second arrangement, the bowsprit with all its appendages, is hung upon pivots, or hinged so as to permit it to be hoisted up from the outer end, and either to be secured to the foremast or steadied by guys.

Or, by a third method, “ I cause what is called the ‘ housing ’  
 “ of a bowsprit to circulate between two fixed rings, the bowsprit  
 “ working round a bolt fixed in the centre of the circle, and  
 “ which can be firmly fixed and secured to any part of it.” “ The  
 “ fixed rings should be placed high enough above the forecastle  
 “ deck to be clear of all obstructions, and by the help of purchases  
 “ or other mechanical powers, the bowsprit could be placed at a  
 “ right angle to the keel of the vessel or at any one abaft it until  
 “ it was stopped by the ship’s yards or rigging, in this way the  
 “ ship’s head would be quite clear of her intended victim.”

[Printed, 8d. No drawings.]

A.D. 1858, December 23.—N° 2935.

**BROOM, JAMES.**—(*Letters Patent void for want of final specification.*)—This invention relates "to the manufacture of steel of  
" good fair quality, equal to blister and spring steel, in the  
" puddling furnace, or in any other furnace or apparatus of  
" generally similar action, from crude pig iron. The pig iron is  
" deposited in its raw untreated state in the furnace, and it is  
" worked and puddled in the usual way, except that the furnace  
" is kept as full as possible of pure white flame, the atmospheric  
" air being excluded from it as much as is practically possible.  
" In addition to this, the mass of iron under treatment is kept  
" well surrounded with cinder as a protective covering or coating  
" to keep off the contact of air with the metal. And in case the  
" cinder should not afford a sufficient covering, sal ammoniac or  
" salt may be added to improve its protective powers." When  
this material has been tilted, hammered, rolled, or otherwise  
mechanically treated, it becomes good steel, suitable for a variety  
of purposes, and particularly for boilers and ships.

[Printed, 3d. No drawings.]

1859.

A.D. 1859, January 8.—N° 66.

**DELANY, WILLIAM**—(*A communication from Lodner D. Phillips. Provisional protection only.*)—This invention has for its  
object improvements in submarine boats or vessels, and in appa-  
ratus for working under water. The submarine boat or vessel is  
elliptical, or rather egg-shaped in transverse section, and runs off  
to a point at both ends; and at the top, bottom, and sides, four  
or other number of keels are fixed to keep it steady in the water.  
Within the boat or vessel are two strong metal tanks, into one of  
which air can be forced by an air pump. This tank is connected  
with the second tank by a pipe, furnished with a cock, and the  
second tank also communicates by a pipe with the water outside  
the boat or vessel, so that a person within the boat or vessel can fill  
this second tank with water, and thus increase the weight of the boat

or vessel, so as to cause it to sink ; or, by allowing the air to pass from the air tank to the water tank, the water may be again ejected, so as to lighten the vessel sufficiently to cause it to rise to the surface. Through one end of the vessel a hollow shaft passes, by a ball-and-socket joint, and on this shaft a rudder is mounted ; beyond the rudder there is a screw propeller, which is driven from the interior by an axis passing through the hollow shaft of the rudder. The persons within the boat or vessel are supplied with air from time to time from the air tank, and the vitiated air is allowed to escape by a cock into the exterior water. Double doors are formed in the top, bottom, and sides of the vessel, and these may be opened beneath the water to allow of ballast being passed out when necessary, and for other purposes. In conjunction with this boat or vessel, a diving armour is employed, so that when the boat or vessel arrives at a point where work is to be done, a diver may leave the same to do whatever may be required. This armour is formed of metal, the moving parts being so fitted and jointed together, that the pressure of the water may be sustained by the armour, and not communicated to the body of the diver. Through the sides of the armour a number of tongs pass, with which the diver can hold any tool with which he has to work, or any other article ; these tongs pass through ball-and-socket joints, and are arranged to be readily acted on from the interior of the armour, so as to cause them to open and close. Into the ball-and-socket joints any tools may be fitted, and these also serve to pass short tools from the exterior to the interior of the armour, as may be required. The diver is supplied with air from the air tank within the boat or vessel, or otherwise, and he also carries on his back a reservoir of compressed air, which enables him temporarily to disconnect the hose, if required. The rope by which the diver is lowered is also so arranged that the diver can disconnect it if he desires. Exterior of the armour is an elastic bag, into which the diver admits air so as to inflate it, when he wishes to rise to the surface. A lamp is mounted within the armour, and in front of the same is a bull's eye, which concentrates the light on objects in front of the diver.

In order to facilitate the movement of the diver, a screw propeller is attached to the front of the armour. The submarine

boat or vessel is in some cases fitted with steam engines, to propel it more rapidly when it is at the surface of the water; the same power also serves to pump air into the tank.

[Printed, 3d. No drawings.]

A.D. 1869, January 12.—N° 92.

OLIVER, WILLIAM.—“Improvements in the construction of  
“boats of the ordinary description, such as pleasure boats, ships  
“boats, or otherwise, with the view of enabling them to be pro-  
“pelled by the feet of the operator.” The improvements consist  
“in employing for the said purpose paddle wheels placed on  
“either side of the boat, and connected through the medium of a  
“crank shaft, to which motion is communicated through the  
“intervention of treadles, the said wheels being moved in either  
“direction, and one or both of the same actuated at pleasure by  
“the employment of a slide-rod motion and disconnecting gear,  
“whilst, for the convenience of steering, the yoke lines are  
“brought round and secured in the front of the operator, who  
“sits with his face towards the bows.”

[Printed, 6d. Drawings.]

A.D. 1859, January 13.—N° 107.

CRISPIN, WILLIAM HENRY.—(*Provisional protectum only*)—  
This invention relates to “certain improved methods of combining  
“iron and timber in the construction of ships and other sailing  
“and steam vessels. The hull of the ship or other vessel is con-  
“structed of iron which may be considerably thinner than that  
“usually employed in iron ships, the same being covered exter-  
“nally and internally with wooden planking bolted completely  
“through the iron and wood, and so arranged as to break joint,  
“and thus add to the strength of the vessel. The external  
“and internal woodwork should be caulked in order effectually  
“to prevent leakage. In some cases it may be desirable to place  
“the external planking in the ordinary horizontal manner, and  
“to arrange the internal planking diagonally, and where great  
“strength is required the series of wood, iron, and wood may be  
“duplicated or tripled. The hull thus constructed admits of  
“being sheathed with copper or other sheathing metal, and thus  
“obviating one of the great objections to iron ships; while in the

“ case of ships of war the arrangement of wood and iron in accord-  
“ ance with this invention will prevent the disastrous conse-  
“ quences occasioned by the fragments of iron when ships built  
“ entirely of that material are struck by shot, at the same time  
“ much greater facility being afforded for repairing the shot  
“ holes. The deck of the ship or vessel may be constructed upon  
“ the same principles as the hull, in which case it may be desir-  
“ able to place the lower or under planking transversely or across  
“ the ship.”

[Printed, 3d. No drawings.]

A.D. 1859, January 17.—N° 137.

MONTGOMERY, JAMES.—The first part of the invention relates to improvements in the construction of “the hulls of  
“ vessels, so as to increase their strength, and to facilitate their  
“ passage through the water by providing for the more rapid  
“ replacement of water displaced at the bow.” For this purpose, the hull of the vessel is constructed with an inverted trough or cavity, commencing at or near the stem, and rising gradually to near the stern, where it turns more abruptly upward, and forms a space to accommodate a screw propeller. The cavity may present in all parts of its transverse section (excepting at the extreme bow), an arc of uniform chord and decreasing radius, so as to increase in vertical depth until it terminates near the stern. For vessels designed for use in very shallow waters, more troughs than one will often be used, a screw propeller being placed in the after part of each.

The hull may have one or more bulkheads extending from stem to stern, and water-tight transverse bulkheads at suitable intervals. The decks, bulkheads, and sides are formed chiefly of plate iron, the metal of the upper and lower portions of the sides being much thicker than that of the intermediate portions, the top and bottom plates being of about equal thickness. There are two rudders, placed one on each side of the cavity, and turned simultaneously by any suitable means.

The propeller may consist of two or more helical blades, surrounded by a metallic cylinder, rivetted to and revolving with them. It is placed in a plane somewhat oblique to the perpendicular, so as to enable the propeller to counteract the disposition

to settle by the stern, which canal boats in particular are subject to, from the smallness of the body of water through which they pass.

"The tenth part of the invention consists in supporting a  
 "screw propeller and its actuating mechanism within a vertical  
 "or oblique cylinder, opening downward through the bottom of  
 "the ship. An air-tight piston intervenes between the engine  
 "and the propeller, and the whole is elevated by means of screw  
 "or other gearing, so as to adjust the propeller to any degree of  
 "immersion, or to entirely withdraw it from the water, as  
 "desired. A flange or ledge projecting inward at the bottom of  
 "the aforesaid cylinder affords support for a turntable arrange-  
 "ment, upon which the machinery is based, and by this means  
 "the propeller is adjusted to any angle in a horizontal plane, so  
 "as to move the ship forward or astern, or laterally, or to steer  
 "without the use of a rudder, in the event of the rudder being  
 "injured or lost.

"Two such propellers revolving in opposite directions can be  
 "made to rapidly turn a vessel in her own length."

"By throwing a clutch into gear the blower or any other  
 "auxiliary engine may be employed to elevate the propeller by  
 "the use of a crank on the upper end of the vertical screw-ended  
 "shafts"

[Printed, 6s. 7d. Drawings.]

A.D. 1859, January 20.—N° 170.

REID, JAMES CROFT, and MILNER, WILLIAM.—"Certain  
 "improvements in the construction of ships and vessels." This  
 invention consists in "preventing the extension of fire in ships or  
 "vessels by dividing them into compartments with double bulk-  
 "heads or partitions filled with a fire-resisting material, evolving  
 "moisture on the application of heat, and thereby forming walls,  
 "either in the direction of the length or across the vessel, imper-  
 "vious to and impassable by fire."

[Printed, 10d. Drawings.]

A.D. 1859, January 24. N° 209.

HOMERSHAM, WILLIAM COLLETT.—"Improvements in  
 "floating 'gridirons' or stages for repairing ships or other

“ vessels.” This invention has for its object the construction of floating “gridirons,” or structures for supporting ships while under repair; and consists in combining two series of hollow air-tight caissons of cylindrical or other suitable form, placed transversely to each other, so as to form a rigid structure, on which the platform for carrying the ship or vessel is fixed. The caissons are arranged so that the lower series lie in the direction of the length of the vessel, and the upper series transversely to them. The upper or transverse series are curved, so as to give stability to the structure by counteracting the tendency to heel over in a transverse direction, but they may be made straight; and the longitudinal series are preferred to be straight, but they may be curved either in elevation or in plan. It is preferred that the upper or transverse series should be rectangular in the cross section, and the lower or longitudinal series circular or oval. The sinking of the structure, and the required degree of buoyancy of the platform, are caused by letting water into or out of the caissons. The pumping or other apparatus for withdrawing or forcing the water therefrom, may be fixed on a platform or platforms on one, or on each side of the structure, and at such a height as to be above the surface of the water when the structure is sunk in order to receive a vessel; or it may be fixed on shore, or on another floating vessel, and be made to communicate with the caissons by means of a flexible pipe or pipes. Bulkheads or partitions, furnished with the necessary valves, are fixed in the caissons at convenient distances apart. Sliding caissons are provided at the sides, for giving stability when water has been admitted into the lower caissons.

[Printed, 10d. Drawings.]

A.D. 1859, January 24.—N<sup>o</sup> 218.

PROGER, JOHN GUY, and DAVIES, DAVID.—“ This invention has for its object improvements in lanterns used on board ship to signal to the steersman.” The lantern is by preference of a cylindrical form, and is provided with a screen, by which the light inside the lantern will be prevented passing through the lens, so long as no signal is required to be given; and will, in fact, be a dark lantern. The dark part of the screen has on one side of it a portion of green glass, and on the other side a portion of red glass; so that on moving the screen, either the red or

green glass is introduced between the light and the lens, and a stream of green or red light will be thrown towards the steersman, according as it is desired that he shall steer to the "starboard" or "port." The screen is moved by a suitable handle outside the lantern.

In the daytime the cover of the lantern is removed, and a plate of glass is placed over it; the light passing through this, is thrown by a reflector through the lens, and enables the steersman to see the signal intended to be conveyed to him by the lantern.

[Printed, 1s 6d. Drawings.]

A.D. 1859, January 24.—N° 220.

SWAN, MICHAEL.—*Provisional protection only*).—"Improvements in ballasting ships, applicable also to the extinguishing fires on board ships." "This invention, so far as it relates to the ballasting of ships, consists in constructing the ship with double sides and bottom, that is to say, with an entire inner shell, leaving an air-tight space for water and air at the bottom and sides thereof, forming the ballast chamber or chambers. A semicircular or other shaped compartment is or may be made longitudinally over the keel along the bottom of the inner shell, such compartment (which may be subdivided into a series) being open on its under side, so as to receive water from below, and thus forms another ballast chamber or set of chambers whilst it adds strength to the ship. This compartment is in direct communication with a valve which admits water through the ship's bottom up to any desired height in the sides according to the amount of ballast required, and is also in connection by means of pipes passing up the inner sides of the ship with the ship's pump. Stop valves or hydrants are fitted to these pipes, and ballast chambers for receiving hose pipes in case of fire, whereby a plentiful supply of water can be readily obtained at all parts of the ship."

"In order to obtain a supply of water in case of fire in any portion of an ordinarily built wooden or iron ship, I propose" to insert valves into the bottom or sides or both of the ship, the side valves being placed below the light load water line. These valves open into pipes running up the inner sides of the ship, or branching in any convenient direction. Hose junctions are connected to these pipes, so that water can be directed by

“ its natural flow to any part of the ship below the water line;  
“ whilst other pipes will lead upwards to powerful force pumps  
“ furnished with hose junctions and pipes.”

[Printed, 3d. No drawings.]

A.D. 1859, January 25.—N° 223.

JOHNSON, JOHN HENRY.—(*a communication from Peter H. Niles.*)—“ Improvements in machinery or apparatus for cutting  
“ and shaping wood.” This invention relates “to a peculiar  
“ construction and arrangement of machinery for turning articles  
“ of a tapered or irregular form, which, by reason of their great  
“ length, would be apt to bend and vibrate if attempted to be  
“ turned in an ordinary lathe without suitable intermediate sup-  
“ ports between the ends of the article for steadying the same.”  
“ According to this invention the stick of timber is held station-  
“ ary, being rigidly fixed in the machine, whilst the cutters are  
“ supported in a carriage which traverses from end to end of the  
“ machine, the cutters revolving at the same time round the  
“ stick. The stick is steadied or supported between its two ex-  
“ tremities by means of ‘dogs’ or props, which are so arranged  
“ that they may be moved out of the way of the cutters as the  
“ latter approach, and return again to their duty after the cutters  
“ have passed, their motion being effected either automatically by  
“ the machine itself, by means of suitable grooved cams or cylin-  
“ ders and eccentrics worked by projections on the cutter carriage,  
“ or by the attendant in charge of the machine. The cutters are  
“ fitted in radial slots in a spur wheel, having a central aperture  
“ made therein for the timber to pass through as the cutter car-  
“ riage and cutters travel along it, for which purpose the cutter  
“ wheel is fixed on to the end of a hollow or tubular shaft, of  
“ sufficiently large bore to receive the largest articles to be operated  
“ upon, and allow it to pass freely therethrough. Immediately  
“ behind the cutter wheel is another wheel of the same size, but  
“ having slots made in an inclined direction, into which inclined  
“ slots the shanks of the cutters enter. Both of these wheels are  
“ formed with spur teeth for the purpose hereafter referred to,  
“ and when they are both revolving together their cutters will  
“ remain at a certain fixed distance from the centre; but when  
“ the hind wheel is made to turn in advance of the other slightly,

“ its inclined slots will cause the cutters to move outwards or  
“ inwards, as the case may be, and thereby produce the required  
“ taper of the mast or spar, or other article. This expanding  
“ movement of the cutters is effected by means of three spur  
“ pinions connected with levers and arms, worked by an inclined  
“ pattern slot in such a manner that one of the pinions which  
“ gears with the hind cutter wheel with the inclined slots shall  
“ move bodily to and fro when requisite, thereby turning more or  
“ less in one direction or the other the hind cutter wheel, and  
“ expanding or contracting its cutters. The second spur pinion  
“ acts as a carrier wheel, and gears into the first pinion and into  
“ the third, which latter gears into the front cutter wheel, and has  
“ a fixed in place of a moveable centre. The hollow cutter shaft is  
“ rotated by means of an endless chain, and the cutter carriage  
“ is made self-traversing by using a spur pinion driven from a  
“ wheel on the cutter shaft, and engaging or not as required  
“ with a rack fixed into the bed of the machine.”

[Printed, 10d. Drawings.]

A.D. 1859, January 29.—N<sup>o</sup> 269.

**GRISSELL, HENRY.**—This invention has for its object improvements in machinery for moving ships and vessels on ships or inclined ways. For these purposes hydrostatic presses are arranged to act in succession on a chain, in such manner as to give a continuous motion to such chain, and to the cradle or carriage connected thereto. The parts of the chain as they pass the presses go out of use, and are detached in succession, and the parts detached are received on to a carriage. This carriage is moved on a way formed transversely of the slip, so that the parts of the chain, when detached, may arrange themselves side by side on the carriage, and as the parts of the chain are again required to be connected in order to lower the cradle, the carriage is caused to move back in such manner as to bring up in succession the ends of the parts of the chain to be again connected. “ It is  
“ preferred to use the hydrostatic presses in pairs, the rams of  
“ each pair being connected by a crosshead, or otherwise; two of  
“ such pairs of presses are arranged to come into and go out of  
“ action on the chain alternately, so that one pair of presses  
“ may go out of action and have the rams moved back into

“ position to again come into action on the chain whilst the other  
“ pair of presses is operating on the chain. The crossheads or  
“ parts connecting the rams of the presses are furnished with  
“ instruments in order that they may operate on the chain when  
“ the rams are in action, and become separate from the chain  
“ as the rams go back. In order to aid the rams in going back,  
“ the pistons of vacuum cylinders are arranged to act on them,  
“ and these vacuum cylinders are put in connection with the  
“ condenser of the steam engine which works the pumps or are  
“ so otherwise arranged that a vacuum may be obtained therein.  
“ In addition to the hand gearing for starting and stopping the  
“ presses, there is a self-acting gearing by which as one pair of  
“ hydrostatic presses is going out of action on the chain, com-  
“ munication is made between the water supply and the other  
“ pair of hydrostatic presses, so that the same may be in full  
“ action on the chain when the pair of hydrostatic presses pre-  
“ viously in action is thrown out of action by the gearing, which  
“ is arranged to stop the supply of water to the cylinders of such  
“ hydrostatic presses, and ” to open “ a communication between  
“ the condenser of the engine and the vacuum cylinders before  
“ mentioned, in order that the rams of such hydrostatic presses  
“ may be brought back into position to act again on the chain in  
“ their proper order. In like manner may single hydrostatic  
“ presses be caused to act in succession so as to keep up a con-  
“ tinuous motion to a chain.”

[Printed, 10d. Drawings.]

A.D. 1859, January 31.—N<sup>o</sup> 278.

BOOTH, JOHN PETER.—“ Improvements in ventilating ships.”  
The object of this invention is to ventilate thoroughly the interior  
of ships or vessels, by inducing currents of air to pass through  
certain channels or passages provided for the purpose. This  
object is effected by means of vertical or downcast shafts, com-  
municating with horizontal, longitudinal, or transverse “shutes”  
or channels provided with apertures, arranged in any convenient  
manner for the distribution of the air to every part of the vessel.  
The vertical or downcast shafts should be provided with movable  
cowls, which can be placed to or from the wind, so that the ex-  
ternal air will enter, and from this colder air having greater

## SHIP-BUILDING, REPAIRING,

gentry than the purified air in the ship, it will descend to the horizontal channels provided below. "I provide for the escape of " the vitiated air by means of tubes or shafts, or by both, by " which the foul air from the cabins will ascend and pass off." In tropical climates double coverings may be made to extend over all the cabins, and the stratum of air contained in these channels will form a non-conductor and prevent the heat of the sun from acting upon the cabin apartments. If deemed desirable, any of the vertical shafts may be made to act as chimneys and by thus warming the air a current or draft will be created; or a partial vacuum can be produced by admitting a jet or jets of steam into the up-cast vertical shaft, or a fan, which may be driven by the steam power, may be employed to expel or inject air. The horizontal channels or air distributors may also be warmed by means of hot water pipes placed in them for the purpose, so that in inclement weather the fresh air supplied to the occupants of the cabins may be warmed.

[Printed, 15 Drawings.]

A.D. 1859, February 4.—N<sup>o</sup> 325.

MASSON, JACQUES MARIE EDOUARD.—"Improvements in " apparatus to facilitate working under water." The submarine vessel employed by the inventor, consists of an iron cylinder about 25½ feet long and 8 feet in diameter, having at one end a movable conical shell to form a bow, and at the other a screw propeller and rudder. It is also provided with an electrical apparatus for communicating with the attendants above.

When the machine is about to descend, air is pumped into it until the pressure corresponds with that of the column of water under which the divers may wish to work. The communication with the pumps is then cut off, and the cylinder is allowed to descend, the velocity of descent being regulated by admitting water into two cylinders attached to the inside of the bottom of the submarine vessel, and communicating by valves with the sea. Should it be considered desirable to stop at any given distance above the bottom, a heavy weight is lowered from the interior to the distance required, and when it touches the bottom the sudden loss of weight will arrest the descent of the vessel.

On reaching the bottom, shutters may be opened on the under

side of the cylinder, and communication with the bottom of the sea established.

In order to obtain greater pressure, to enable them to work in a deeper part of the sea, or to carry heavy bodies to the surface, carbonic acid or other gas may be generated in the machine, by the union of sulphuric acid and bi-carbonate of soda, or by other means. This gas may either be forced into the cylinders at the bottom of the machine, thereby expelling the water therein, or india-rubber bags suspended within the machine may be filled, and thus the air within the vessel itself condensed.

[Printed, 7d. Drawings.]

A.D. 1859, February 4.—Nº 328.

HONEYMAN, JOHN.—“ Improvements in the construction of  
“ ships, vessels, and boats, and in propellers for propelling the  
“ same.” This invention relates to a peculiar system or mode of  
constructing the hulls of such ships, vessels, and boats, as are  
especially adapted for the improved screw propeller, which is the  
main part of the invention, and which may be applied to any  
form of ships, vessels, or boats, although the following form will  
be most suitable for it.” “ According to these improvements the  
“ lower part of the hull of a ship or other vessel, that is to say,  
“ the portion that is below the water line, is not contracted and  
“ narrowed into a wedge-like form, but is built of a cylindrical  
“ figure, the width of which corresponds to the width of beam  
“ at the upper part of the hull. This enlarged portion of the  
“ hull extends from the bow of the vessel backwards nearly to  
“ the stern, where it is hollowed in so as to form a concavity or  
“ recess at the parts adjacent to the stern post. The enlarged  
“ part of the hull is made of uniform width from the stem back-  
“ wards, until it curves away inwards to the stern post; or in  
“ lieu of making the sides straight and parallel to each other,  
“ they may be made gradually narrower as they approach the  
“ inwardly curved part at the stern. The cylindrical portion of  
“ the hull projects well out at the stern, where it is enclosed by  
“ metal plates or timber, so as to form a flat vertical surface. At  
“ this part a screw propeller is fitted, the driving shaft of which  
“ is carried through the end disc of the cylindrical part; the  
“ screw propeller consists of a conically-shaped drum having

" vanes or blades extending backwards in a curved direction from  
 " the apex of the cone to the base. The disc which forms the  
 " base of the cone is made to correspond in diameter to that which  
 " encloses the cylindrical part of the hull, the apex of the cone  
 " forming the outward termination of the lower part of the hull.  
 " The driving shaft passes through the central line of the cone to  
 " which it is keyed or otherwise secured, and is carried thence  
 " inside the hull, and connected to the engine or other prime  
 " mover. When this propeller is put in motion its conical figure  
 " causes it to pass through the water with great facility, the water  
 " that is moved aside by its action glides smoothly and without  
 " obstruction along the sides of the hull until it arrives at the  
 " concave part near the stern, where it closes in, and by its re-  
 " action on the hollow portion of the hull assists the onward  
 " progress of the vessel, by which an increase of speed is  
 " obtained."

[Printed, 10d. Drawings.]

A.D. 1859, February 7.—N° 341.

CRISPIN, WILLIAM HENRY.—(*Provisional protection only*).—  
 " An improved atmospheric and hydraulic engine for sailing and  
 " steam vessels." The invention relates to certain improved  
 methods of obtaining power, and of applying the same to various  
 purposes for which it may be required in sailing or steam vessels.  
 The power is to be obtained " by the oscillation of a pendulum,  
 " the vibration whereof is caused by the motion of the ship,  
 " suitable arrangements of wheelwork or other necessary con-  
 " trivances and combinations of machinery being actuated by the  
 " pendulum when in oscillation."

[Printed, 3d. No drawings.]

A.D. 1859, February 11.—N° 392.

RANSFORD, HENRY.—(*Provisional protection only*). " This  
 " invention has for its object an improvement in building ships  
 " and other vessels, and consists in constructing each ship or  
 " vessel (whether for sailing or propelled by steam) wider at the  
 " floor than at the water line, the fore and aft parts of the ship  
 " or vessel below the water line being modified accordingly."

[Printed, 2d. No drawings.]

A.D. 1859, February 12.—N<sup>o</sup> 399.

WHITE, THOMAS, and JENKINS, GEORGE.—“ Improvements  
“ in apparatus for raising and lowering ships along inclined slips.”  
This invention relates to a peculiar construction and arrangement  
of hydrostatic apparatus, whereby a continuous heaving and  
lowering action is obtained in moving ships out of, or into the  
water, along an inclined slip. According to one mode, “ it is pro-  
“ posed to employ two or more hydrostatic cylinders placed in  
“ the same longitudinal axial line, and furnished each with a  
“ tubular ram or trunk, through the centre of which passes the  
“ traction rods or chains. Each ram or trunk is furnished at one  
“ end with a stopper connected with a weighted lever, and so  
“ arranged that it is free to be entered into the joints of the traction  
“ rods or chains when the ram is to act thereon, and to be raised  
“ or released therefrom when the ram is no longer required to act,  
“ or is making its return or back stroke. The several cylinders  
“ and rams are so worked that one shall come into action just  
“ before the other has completed its stroke, so that the hauling  
“ or lowering motion of the traction rods or chains will be con-  
“ tinuous. As each ram arrives at the end of its forward stroke,  
“ it presses upon a catch which opens an escape valve for the  
“ escape of the water behind it, whilst it is run back by the  
“ action of a separate small cylinder worked by the force pumps,  
“ or by a counterweight. In lowering a ship the water is allowed  
“ to escape slowly from the cylinders through a small adjustable  
“ aperture made for that purpose in each cylinder. In place of  
“ having tubular or hollow rams or trunks with the traction rods  
“ or chains passing through them, ordinary rams may be used  
“ with a traction rod or chain on each side of the cylinder, con-  
“ nected by cross bars, or two sets or lines of ordinary cylinders  
“ and rams might be employed with one traction rod or chain  
“ working between them. In order to regulate the power and  
“ speed for working the pumps, it is proposed to use discs with  
“ adjustable crank pins therein; or an eccentric may be keyed  
“ on to the working shaft, and a plate fitted loosely into the side  
“ of the eccentric, into which plate the crank pin is fixed, so that  
“ on turning the plate round in the eccentric the throw of the  
“ crank may be varied to any required extent, and retained in  
“ position by palls and ratchet teeth.”

[Printed, 1s. 4d. Drawings.]

A.D. 1859, February 15 —N° 420

RAYMOND, WALTER.—This invention consists of a life raft, constructed as follows.—“I employ two semi-cylindrical vessels  
“ of corrugated galvanized sheet iron with tapering round ends,  
“ the concave portions to be filled in with cork or other light  
“ buoyant material,” attached thereto by adhesive waterproof  
material. Over this is to be placed a complete substantial  
covering of cork or other light substance, attached thereto by  
the same means, and a coating or covering of canvass, “secured by  
“ a casing of cork applied as before mentioned,” the whole to be  
secured and bound by corrugated galvanized iron bands. “At  
“ each end of the cylindrical vessels a small tube is sunk with  
“ appropriate covers, so that water may be kept in the cylinders  
“ when not in use, and when required to be used the water may  
“ be withdrawn through man-holes on the upper surface of  
“ the cylinders, the air passing in and filling up the vacuum  
“ through the tubes before mentioned; these tubes being used  
“ for the steps of masts, oars, or other purposes when necessary.  
“ Tubes or air chambers are placed on the cylinders near the top,  
“ and run longitudinally so as to form lockers and seats; beneath  
“ these tubes on one cylinder I place a hinged flap covered with  
“ cork or other material, the lower edge of this flap being supplied  
“ with rings at intervals; corresponding rings are also placed on  
“ the side of the other cylinder, so that upon lifting the flap, and  
“ passing a chain or bar through the rings, the flap connects and  
“ forms a deck between the two cylinders.” For the safe conveyance of mails, specie, bullion, &c., it is proposed that the semi-cylindrical vessels be made as before described, but without the bands or rings; a large oval cover is to be so arranged as to receive and discharge the contents; and they are to be colored, marked, and numbered, that in the event of shipwreck or fire they may be thrown together or separately overboard with safety, so as to be picked up.

“These cylinders will be found useful to lift gunboats or other  
“ vessels over shallows or bars, also to float stranded vessels.”

[Printed, 3d. No drawings.]

A.D. 1859, February 19.—N° 461.

**CLAY, WILLIAM.**—This invention relates to the manufacture of beams and bars of various forms, by the use of puddled steel, for the purpose of obtaining increased strength and rigidity. “ In carrying out my invention, I take the puddled steel in the “ form of a bloom or billet, and subject it to the action of suitable “ rolls ; or I pile or arrange bars of steel cut to suitable lengths “ (either in combination with or without bars of iron), and having “ carefully heated the pile in a reverberatory or other furnace, I “ subject it to the action of suitable shaping rolls. In preparing “ the pile, I arrange the metal bars which are to compose it in “ such a manner as to have the fewest practicable number of external “ joints, and this I effect by forming the external part of the pile “ of two bars of a trough or a V shape, and the vacant space “ formed by bringing these bars together I fill with other bars, “ which may, if required, be of different temper or quality to that “ of the exterior bars. Another method of piling which I also “ propose to employ, and which would not require the use of any “ special form of bar (such as the trough or V bars above “ mentioned) is that known in the manufacture of iron as box “ piling.”

[Printed, 8d. Drawings.]

A.D. 1859, March 3.—N° 572.

**MITCALFE, WILLIAM.**—(*Provisional protection only.*)—“ Im- “ provements in discharging cargoes, and in raising and lowering “ bodies.” “ This invention relates more particularly, but not “ exclusively, to the unloading of coal from ships in a tideway, “ and consists in taking advantage of the flow of the current in “ either direction (by means of a water wheel, or equivalent ap- “ paratus) to accumulate power, by which baskets or buckets of “ coal may be rapidly hoisted out of the ship’s hold, either by the “ application of such water power alone, or as an addition to other “ power,” by which the present system of “ whipping ” by manual labour will be superseded.

[Printed, 8d. No drawings.]

A.D. 1859, March 5.—N° 578.

**BAILES, WILLIAM, and BAILES, JAMES.**—(*Provisional protection only.*)—"An improved ship's berth, for prevention of sea sickness, composed of wood" and metal. This cradle is composed of transverse and longitudinal ribs of iron or wood, all of which are concave, so as to form a hollow instead of a flat bottom. These ribs are attached to a rectangular frame, which is enclosed within an outer frame. The inner frame is supported by the outer one, by means of a pivot at the head and at the foot; and the outer frame is supported by a pivot in the middle of its length on each side, one of which pivots enters a socket in the ship's side, and the other a socket in the top of a standard fixed to the deck. Thus, when the ship rolls, the inner frame swings on the head and foot pivots; and when it pitches, the outer frame swings on the side pivots, and carries the inner frame with it. The motion is regulated by india-rubber bands.

[Printed 1d. Drawings.]

A.D. 1859, March 5.—N° 583.

**VIGERS, EDWARD.**—(*Provisional protection only.*)—This invention relates to the construction of ships and other vessels, and consists in a novel combination of wood with iron. "Instead of employing angle or T iron, or channel or trough iron, for the frames of ships and other vessels, and then plating them externally with iron, or after bolting or otherwise fastening timber thereto, planking over the outside (or both the inside and the outside) I take bar iron which instead of being of the ordinary flat parallel form, is taper in section, being thinner on one edge than on the other; I bend these bars on edge to the requisite curve or required form, and mould them according to the part or section of the vessel to which they have to be applied. I attach these bent bars to the keel, either by means of clips or other suitable fastenings, setting them at a suitable distance apart; I connect them together in pairs or otherwise by means of double-round or T-headed bolts, or bolts and nuts, or other fastenings; or I frame the whole together from stem to stern by means of stringer plates fixed or secured to the interior edge of each of the iron frame bars or ribs, either in a series of several stringer plates or bars, each taking a number of frame bars or

“ ribs throughout the length of the ship, or by means of several ”  
parallel “ rows of stringers one above the other, running from  
“ stem to stern upon each side. Between each pair of taper iron  
“ frame bars or ribs, or as frequently as may be requisite, I insert  
“ a timber piece of the proper curve and tapered at the sides to  
“ fit it into the taper space formed by the sides of the taper bars,  
“ and there secure them,” by bolting or otherwise. By planking  
over or plating, and fastening with bolts, rivets, or treenails,  
through the thickness of the timber filling pieces, “ I am enabled  
“ to construct ships or other vessels ” of great strength and in-  
ternal capacity.

[Printed, 3d. No drawings.]

A.D. 1859, March 9.—N<sup>o</sup> 615.

RUSSELL, JOHN SCOTT.—“ This invention has for its object  
“ improvements in building ships and other vessels, and consists  
“ in constructing the framing of a ship or vessel of angle and  
“ other bars made of yellow or Muntz’s metal, and in plating  
“ such framing with sheets of like metal, and also in plating  
“ frames of ships or other vessels constructed of angle iron or  
“ other bars of iron with sheets of yellow or Muntz’s metal. The  
“ sheets of such yellow or Muntz’s metal are to be fastened to  
“ each other and to the framing by rivets of the same metal. The  
“ cutwaters also and the stern and rudder posts and other parts  
“ of the framing of ships and vessels as well as the rudders are  
“ to be by preference of Muntz’s or yellow metal.” “ The yellow  
“ or Muntz’s metal is brought to the section required by rolling,  
“ just as is the case with iron, and it is worked in a similar  
“ manner. The stern post and other parts which in iron ships  
“ are forged, I prefer, when yellow or Muntz’s metal is used, to  
“ cast to form.”

[Printed, 3d. No drawings.]

A.D. 1859, March 10.—N<sup>o</sup> 623.

LODGE, HENRY.—“ Improved means of protecting ships, bat-  
“ teries, and other constructions or buildings from the effects of  
“ projectiles of various kinds.” “ The object of my invention is  
“ to form protecting plates for batteries or ships by combining  
“ several sheets of any one or of several metals,” all the sheets  
No. 19.

being similarly corrugated or grooved, so that they will fit closely and compact together. "By using two or more metals, say, for example, steel and iron sheets alternately, I obtain a degree of elasticity which will be found of the utmost importance, as it allows the plate to yield to the percussion or force of the shot or shell with which it may be struck." The external plates or sheets of each battery plate may be of copper, yellow metal, zinc, galvanized iron, or other metal, having the property of resisting the action of salt water. These grooved or corrugated battery plates can be fastened by strong bolts to the side of any vessel or battery, or they may be attached by chains. In "some cases I propose to place behind the battery plates strong metallic springs, which will increase the elastic resistance of the plates."

[Printed, 7d Drawings.]

A.D. 1859, March 15.—N° 651.

**GALLOWAY, GEORGE BELL.**—"Improvements upon and in connection with my former patents, and in the manufacture of fuel, and working steam engines more economically."

The first part of the invention relates to improvements in steam ships, and consists in affixing two narrow wheels upon each side of an improved vessel, which is to be denominated "a locomotive steam ship. The position of these wheels may be at or within the midship section of measurement, say, one-third of the length of the vessel; the paddles attached to the wheels may either revolve by a reciprocating motion or be affixed at suitable angles, and in steamers used on rivers and for towing vessels, I affix the paddles at a suitable angle to turn the water off the sides of the steamer and bow of the ship when towing."

The dimensions of vessels intended to be constructed on the locomotive principle may be "three hundred feet length, fifty feet breadth, and thirty feet depth, from the promenade deck to the keelsons or bottom of the ship, or proportions equal thereto, and their forward part may resemble above the water line what is understood by a flared-bowed built vessel. I also propose to adopt a similar plan and proportionate dimensions for river passenger steamers, and may alter or construct their cabins, and place them upon their decks, embracing suitable

“ divisions to suit the class of passengers.” Seats may also “ be placed around the outside of the deck cabins or saloons.”

The improved vessels “ may be built or constructed with what I term angle irons, to which the plates, if made of iron, may be fastened or secured in the horizontal and vertical sections, the angle iron will form a frame, and thus impart additional strength.” The iron for the horizontal section may be specially prepared at the end with a lap or short bend, to secure it to the vertical section or frame, or flat iron may be used as between the vertical frames, and the plates of the vessel (if made of iron) may be affixed to the frame thus constructed, and (if preferred) I may obviate the necessity of overlapping joints by having the plates made with true edges or partial lap (yet not any overlap), and the plates may be secured by rivets at about, say, two inches from the edge of each plate,” which may be of prepared steel or combined metals, “ and I may apply a suitable solution to the edges of the plates, and between the frames and fastenings to preserve the metal and prevent leakage; I may also apply the principle of construction to boats, boilers, and tanks. I also combine the beams of vessels under the decks, fore and aft, to each other by bolts or angle iron, and in some cases I may apply the iron for beams of ships.

“ The steam vessels may be flat at the bottom, or only in the midship section of measurement, say, one-third the length, and be constructed with three keelsons inside and out, which may be hollow; the main keelsons may be the length of the bottom of the vessel and the other two keelsons, one placed on each side in the midship section, and be affixed thereto; the use of the inside keelsons will be for the affixing of boilers and engines thereto, and those at the bottom of the vessel, the fore part may be formed like a wedge form of entrance, and at the after part there may be affixed a helm or rudder, having a communication with the deck to assist in steering and reversing.”

The vessels may be constructed with fireproof compartments, and be properly ventilated throughout by forcing air through perforated pipes. The boats may be metallic, flat at the bottom, and made to fit or stow within each other.

The engines described are upon the locomotive principle, and it is proposed, in some cases, to “ use the principle of compressed

" water or air for propelling and steering in connection with the locomotive principle."

An appliance may be fitted " to enable the men to work the sails from the vessel's deck by suitable running gear attached to the peak and also to the top of the sail, and the sails may be also stowed to the mast by a suitable lashing rope working as a down haul."

In the event of ships or other " vessels becoming damaged at the bottom parts, I may list or raise them by atmospheric air compressed in tubes or bags which may be secured by chains and appliances to the hull of the vessel, by the aid of a diver, whom " I may supply with a lamp, which I cause to burn under water by a supply air tube through its bottom communicating with the flame, and by another tube affixed to the top the heated air can escape, and when the appliances connected with the bags or tubes are secured, I fill them with air by pumps to produce the required buoyancy, and thus raise or float the vessel." Vessels filled with compressed air may also be affixed within the hull.

" The air for the fires or ventilating purposes may be produced by what I shall term a double fan blast, which is of the ordinary form, except that two are connected."

For the purpose of freeing boats or vessels at sea from water, it is proposed to affix fore and aft through their bottom square tubes near the keel, in each of which is a delivery valve. This valve is affixed within the tube by a hinge similar to the lower box of a pump, but reversed in position.

" To enable men to transport life-boats across sands, I may construct a cradle upon rollers the breadth of the boat, and the carriage, &c, may be moved " by a certain mechanical appliance which is described. With this appliance, " by having a kedge anchor and line laid out at sea, the boat may be easily and safely launched and worked off the land."

" I may also affix within life-boats a swivel gun for discharging lines, to which life preservers of a tubular or oval form may be affixed, which when received can be fastened at each end around the body." " As a means of hoisting and lowering life-boats and ship's boats, I may apply the principle of a hoisting and lowering winch placed within the centre part of the boat or

“ vessel.” The lowering may be effected by a brake; and the ropes may be made partially of tempered wire.

The inventor also describes “ fish fin propellers,” means of propelling life-boats and other vessels, &c., &c.

[Printed, 8d. Drawings.]

A.D. 1859, March 16.—N° 671.

MILLER, THOMAS WILLIAM.—“ Improvements in blocking or  
“ securing ships and other vessels whilst being removed, examined,  
“ or repaired,” by the application of hydraulic power or fluid pressure for these purposes. The invention consists in the employment of a series of presses or cylinders and rams, fitted or fixed upon the movable cradles or platforms of hauling-up slips or slip ways, or to pontoons, rafts, floating or fixed dry docks. The piston heads of these presses may be fitted with beams, crossheads, or vibrating arms or levers, capable of adjustment to the form or angle of the ship’s side or bottom, and such arms may be fitted with friction rollers, or be so formed as to act as buffers, or the heads of the rams may come into direct contact with the sides of the vessel, without the intervention of vibrating arms or friction rollers. “ Instead of constructing cylinders in  
“ the ordinary manner of hydraulic or hydrostatic presses, I prefer,  
“ in certain cases, to construct cylinders with trunnions to move  
“ in pedestals set upon proper frames in foundation plates, so as to  
“ admit of their accommodating themselves to the angles or form  
“ of the ship’s side or bottom.” Instead of fixing the machinery upon an independent sole plate or foundation, guide ways or long foundation plates or beds, transversely to and at right angles with the keel line are sometimes laid down, by which means the several hydraulic or hydrostatic machines may be made to approach nearer together, or be extended apart, according to the size of the ship to be hauled up or otherwise docked, for the purpose of examination or repair. “ By this invention the ordinary and  
“ tedious systems of blocking and shoring up ships, and the  
“ great loss of time and materials incident thereto, will be  
“ avoided, as the ship to be hauled up or elevated, whether on a  
“ slipway or a floating pontoon, may be hauled over the cradle,  
“ pontoon, raft, or other platform, and upon attaining the right  
“ position, the rams or pistons may be forced out to the required  
“ extent, so as to retain the ship in its place, and firmly secure or

" block her up so as to admit of her being raised or removed  
 " from out of the water, each cylinder being properly secured at  
 " shut off so as to prevent leakage or escape of its fluid contents."

[Printed, 1s. 4d. Drawings.]

A.D. 1859, March 21.—N° 707.

**HAGGETT, WILLIAM.** This invention consists in giving to iron and other materials, by rolling, pressing, or casting, an undulated surface, composed of longitudinal and transverse corrugations, crossing each other at right angles, or diagonally at such other angles as may be most advantageous for the purpose to which the prepared article is to be applied. This method of increasing strength is applicable to "all metals, wood, cardboard, " paper machee, clay, and all other materials capable of being " rolled, pressed, cast, or moulded;" and the materials so strengthened are applicable, either separately or in combination, to a great variety of purposes, amongst others to ship and boat building and sheathing, railway and tramroad works, canal locks and aqueducts, railway and other carriages and engines, steam and other boilers, hydraulic and other works, tanks, cisterns, pipes, chain cables, and other chains, &c.

[Printed, 6d. Drawings.]

A.D. 1859, March 30.—N° 798.

**COLES, COWPER PHIPPS** "An apparatus for defending guns  
 " and gunners in ships of war, gun boats, and land batteries."  
 This invention consists of "a large convex shield covered all over  
 " its exposed portion with thick iron or other metal, and mounted  
 " upon a platform or frame which is capable of revolving after the  
 " manner of a turn-table, and which also carries the gun upon any  
 " suitable carriage. An aperture is formed in the shield to allow  
 " the muzzle of the gun to pass through it, and this aperture is  
 " somewhat larger vertically than horizontally in order to admit  
 " of the elevation and depression of the gun, the lateral aim being  
 " secured by the rotation of the platform."

[Printed, 6d. Drawings.]

A.D. 1859, April 4.—N° 845.

**WHITE, DAVID BLAIR.**—This invention has for its object improvements in arranging ships' and other pumps. "For this

“ purpose when it is desired to raise water or other fluids from a  
 “ lower to a higher level over an intervening obstacle of greater  
 “ elevation than the higher level of the water or other fluid, I pre-  
 “ fer to employ an ordinary lift pump, which has combined with  
 “ it a syphon-formed outlet pipe, which is carried up from the  
 “ upper or suitable part of the barrel of the pump over the obstacle  
 “ above which the water or other fluid has to pass, and down again  
 “ so as to dip below the water or other fluid at the higher level.  
 “ By this arrangement the water or other fluid is raised to the  
 “ extent only that the difference of levels renders necessary, the  
 “ outlet pipe acting as a syphon to carry the fluid over the  
 “ obstacle.” “ When desired to carry water or other fluid from a  
 “ higher to a lower level over an intervening obstacle, the same  
 “ apparatus is applicable, for by forming a syphon on opening the  
 “ communication between the two levels, the higher at once com-  
 “ mences to discharge itself into the lower; but to carry water or  
 “ other fluid from a lower level on the outer side over an inter-  
 “ vening obstacle to a higher on the inner or pump side, then the  
 “ syphon pipe is caused to communicate by suitable valves with the  
 “ lower part of the barrel of the pump under the bucket, and  
 “ the syphon pipe is thus caused to become the inlet pipe.”

[Printed, 9d. Drawings.]

A.D. 1859, April 6.—N° 860.

**ADAMS, ISAAC.**—(*a communication from Alfred S. Phillips.*)—  
 Improved tubular chain cable guide, or hawse pipe.

This invention consists in the use of a curved instead of a  
 straight hawse pipe, the object being to prevent a sharp turn in  
 the cable as it enters the pipe.

[Printed, 5d. Drawings.]

A.D. 1859, April 11.—N° 904.

**BOWER, ALFRED.**—(*Provisional protection only.*)—The object of  
 this invention is to give vessels a greater hold of the water when  
 sailing to windward, and thereby prevent the vessel making leeway  
 as far as may be practicable, and give her greater stability under  
 canvas. For this purpose movable pieces are attached to the bot-  
 tom of the ordinary keel by a hinged joint, so that they may be set  
 at any required angle by mechanical means, which can be acted

upon from the interior of the vessel; or sliding pieces may be attached to each side of the keel, which can be let down a given distance below the keel; or wing pieces may be jointed to the sides of the keel, which can be adjusted to any required angle thereto by suitable mechanical means.

[Printed, 3d. No drawings. See No. 101 of 1837.]

A.D. 1859, April 11.—N° 907.

CLARK, WILLIAM SOUTHERN. "Improved means of loading ships or vessels with coal, and of separating and removing small coal therefrom." This consists in loading, by means of boxes, tubs, or other suitable receptacles, into which the coal is delivered from the "shute" or incline, and by which it is lowered through the hatchways into the hold, where it is deposited; also in forming the "shutes" or inclines with screens through which the small coal will pass, and, falling on to lower "shutes," will be conducted back to the quay, or discharged into any suitable receptacle, instead of being allowed to pass into the ship.

[Printed, 7d. Drawings.]

A.D. 1859, April 12. N° 910.

CLARK, WILLIAM. "This invention consists of a certain improved method of constructing blocks, whereby much greater certainty of action is obtained in lowering ships' boats and other like or analogous operations, than by any of the contrivances now in use for such purposes." The block, with its sheave or sheaves, is constructed in the ordinary manner, but has attached and secured to the bottom or lower part thereof a "turning hook," formed distinct and separate from the stem or shank, with which it is eccentrically connected by means of a pin or pivot; the stem or shank being slotted, in order that the back of the hook may pass through it. A small metal plate is attached to the stem or shank, so as to move freely, for the purpose of operating as a stop or pawl, or what is known amongst nautical persons as a "ketch," to prevent the back of the hook from passing through the slotted portion of the stem or shank. The last mentioned stop or pawl or "ketch," rests against a metal block or shoulder formed on one side of the stem or shank of the hook, and is kept firmly in position by means of a suitable pin, which is

passed through a hole in the stem or shank, and which pin is sufficiently long to meet the point or bill of the hook, the latter being provided with a hollow in which the end of the pin rests. By this latter arrangement, which is called and known by nautical persons as a "mousing," the cords or chains which may be passed over the hook, are prevented from being accidentally thrown or jerked over the bill of the hook.

When it is desired to use the block, the hook is placed in position, the stop or pawl being held down by means of the pin. The boat or other body having been lowered to the required distance, the pin is withdrawn, and the stop or pawl drawn upwards (which may be done from above by means of a cord or chain), when the back of the hook being liberated, it passes through the slotted stem, the bill falls, and the boat or other body is entirely and instantaneously freed from the tackle by which it has been lowered.

[Printed, 6d. Drawings.]

A.D. 1859, April 23.—N° 1020.

DEBAIN, PIERRE LEONARD MARC. — (*Provisional protection only.*)—"The invention relates to an improved mode of transmitting motive power to ships' pumps, or other similar mechanical arrangements for displacing fluids, and consists in providing the said arrangements with a vessel by preference in the form of a hollow sphere, in the interior of which is situated a diaphragm formed of any suitable elastic material, which diaphragm receives on one of its surfaces the impetus of steam, vapor or other motive power, and by its opposite surface transmits this impetus to the water or other liquid to be acted upon, and which latter, at the required moment, and by means of proper valves, cocks, or other suitable means, is permitted to come in a proper situation for being acted upon by one of the surfaces of the diaphragm, whereas the action of the steam or other prime motor on the opposite surface of the diaphragm is also regulated by any suitable means."

[Printed, 3d. No drawings.]

A.D. 1859, April 25.—N° 1040.

WARNE, WILLIAM, FANSHAWE, JOHN AMERICUS, JAKES, JAMES ARCHIBALD, and GALPIN, THOMAS.—This

invention consists of improved compounds capable of resisting a high degree of heat, and applicable for packing the joints of steam or other pipes, and also for packing or lining parts of machinery in general, or parts of ships, bridges, tanks, or railways. The materials which it is proposed to employ for making the improved compounds, are caoutchouc or india-rubber, gutta percha, or other elastic or flexible gums; bituminous, resinous, or gelatinous substances, or any or all of these, either alone or in combination; to which must be added iron, steel, or other metal filings or borings, or ores of iron or other metals, or oxide of iron or manganese or other metals, or earthy matters containing iron or other metals.

[Printed, 4d. No drawings.]

A.D. 1859, April 28.—N° 1071.

**CLARKE, THOMAS.** This invention consists "in constructing  
" sheaves or pulleys in two parts, in such manner that one or  
" both of the flanges or sides of the groove in which the rope or  
" cable travels, shall be capable of being moved, so that the two  
" may be brought together or towards each other at one part of  
" the circumference of the pulley, and nip or grip the rope at that  
" part, while the rope may travel freely over the other part of the  
" pulley. The motion of the movable part or parts, and there-  
" fore the gripping action, are produced by means of weighted  
" levers, springs, inclined axles, or otherwise. The gripping faces  
" of the flanges or sides of the groove may be furnished with  
" roughened steel plates, or with vulcanized rubber, or other like  
" suitable material, according to the nature of the rope, cable,  
" or cable being payed out or hauled in, or otherwise operated  
" upon."

[Printed, 9d. Drawings.]

A.D. 1859, May 5.—N° 1125.

**CHAPMAN, HENRY.**—(*Provisional protection only*)—This invention consists in adapting a shield to the sides of ships, which is capable of being raised or lowered by a ship's tackle, so as to cover any particular part of a ship, for the purpose of protecting it against injury from shots, shells, or other warlike projectiles. The construction of the shield is as follows:—"I take a square  
" piece of wood or other suitable material, and at the centre and

“ back thereof, and, if necessary, at the corners, I adapt a tube,  
 “ into which ” a piston is fitted. Within the tube “ I place  
 “ india-rubber or other suitable elastic substance or material, for  
 “ the end of the piston to press against,” should the face of the  
 shield be struck by a ball or other projectile. It is proposed to  
 arrange several of the above-described shields side by side, and if  
 desirable, to connect them together, so as to have the combined  
 resistance of the several elastic pistons. These several shields  
 may be advantageously employed as a raft, for landing troops,  
 guns, &c.

[Printed, 3d. No drawings.]

A.D. 1859, May 6.—N<sup>o</sup> 1142.

JONES, THOMAS.—This invention has for its object “ the heating,  
 “ ventilating, prevention of cold draughts, saving of fuel, and  
 “ preservation of property in buildings, ships, and other struc-  
 “ tures. I accomplish this by having a flue, shaft, or equivalent  
 “ carried a sufficient height into the atmosphere to secure purity,  
 “ through which I conduct air to an apparatus or chamber con-  
 “ nected to a fire-grate, stove, or other fire-place ; this apparatus  
 “ or chamber may be made of various shapes, either in metal or  
 “ clay, but retaining the syphon principle. The atmosphere is  
 “ heated and passed forward from this chamber, to be distributed  
 “ over, say, in a dwelling house, the rooms above, and those on  
 “ the same floor, the heated air entering the apartment near the  
 “ floor. Foul air may be drawn from vaults, cellars, and holds  
 “ of vessels into the chamber already described, there rarefied and  
 “ passed into the chimney, which will cause a draught, or it may  
 “ be made to supply a fire with the means of combustion, partly  
 “ or wholly.”

[Printed, 10d. Drawings.]

A.D. 1859, May 12.—N<sup>o</sup> 1193.

OSWALD, THOMAS RIDLEY.—This invention has for its object  
 “ improvements in building ships and other vessels. For these  
 “ purposes the body of a ship or vessel consists of lattice-work,  
 “ the bars composing which are fixed at an angle of about 45° to  
 “ the keel,” and they are rivetted together at their intersections.  
 The keel, cutwater, and stern post are hollow, consisting of angle

iron at the four angles, with plates rivetted thereto, and the bars composing the lattice work are rivetted or bolted to the lower plate of the keel, which extends sufficiently beyond the sides for that purpose. In making the lattice work, it is preferred to use angle iron bars in one direction, and flat iron bars in the opposite direction. In some cases the body frame of a ship or vessel thus constructed, is planked on the outside and ceiled on the inside with wood, the spaces between being filled up with chocks of wood running horizontally in a direction fore and aft, which woodwork is bolted together through and through. In other cases the lattice body is plated over with sheets of iron on the outside, the sheets being fixed by rivets to the diagonal bars of the frame.

Wood keels, cutwaters, and sternposts, may be fixed externally of the hollow metal parts above described, when wood planking is used.

[Printed, 8d. Drawings.]

A.D. 1859, May 13.—N° 1199.

**WHITEHOUSE, WILLIAM.**—(*Provisional protection only.*)—  
“Improvements in steam vessels.” These improvements are as follows:—

1. “A double-ended vessel, propelled by two screws, one at each end, capable of working together, the action of which is either simultaneous or separate, as occasion may require.”

2. A steering wheel raised on a platform above the deck, amidships, the same operating by means of chains or ropes on both rudders at once, by which the vessel can be turned in a smaller space and much more expeditiously than on the ordinary plan.

3. A discharge pipe for waste steam, conducting the steam “by a transverse pipe over each side of the vessel below the surface of the water.”

[Printed, 3d. No drawings.]

A.D. 1859, May 23.—N° 1270.

**BRAMWELL, FREDERICK JOSEPH.**—(*Partly a communication from Messrs Miers Brothers and Maylor.*)

This invention has for its object improvements in apparatus for raising ships and vessels out of the water. “For this purpose I employ on each side of the vessel to be raised a float or pontoon

“ of about the length of the longest vessel ” which it is proposed to lift with that particular apparatus, “ and of such depth and “ width as will give for the sum of the two pontoons a buoyancy “ capable of sustaining the weight of the vessel when raised out “ of the water, with that of the girders to be described, and also “ that of the pontoons and the apparatus on them, with an “ amount sufficient for safety unimmersed. The pontoons I “ prefer to make in wrought iron, and closed upon the top, and “ also to make them with water-tight bulkheads at intervals, but “ they may be made of other materials, may be open-topped, and “ may be without water-tight bulkheads ; they may either be in one “ piece or they may be divided into two or more sections in length, “ which sections may be used independently for shorter vessels, “ or may be coupled together for longer ones. Below the pon- “ toons I have a number of girders placed at a convenient dis- “ tance apart from each other, and extending transversely from “ under one pontoon to under the other pontoon. These girders “ I prefer to connect together by one or more longitudinal girders, “ on which I carry suitable supports and blocks for receiving the “ vessel to be raised. The transverse girders, however, may be “ unconnected by any longitudinal girder, in which case the blocks “ or supports will be on the transverse girders. The transverse “ and longitudinal girders I prefer to make of wrought iron, and “ to make them of such proportions and form that the whole or a “ portion of them being water-tight, will cause the system of “ girders, with the blocks, &c., upon them, to be of such weight “ as will just allow them to sink ; but these transverse and longi- “ tudinal girders, or any portion of them, may be made of other “ materials, and may be made not water-tight.

“ The system of girders being lowered to the requisite depth, “ and the vessel drawn over the blocks, I prefer to raise the whole “ by the following means :—I attach to the ends of the transverse “ girders chains, which I pass through tubes in the pontoons, and “ over pulleys placed near the upper end of these tubes. The “ chains which pass through the pontoons I fasten to traction “ bars extending to about the same length as the pontoons, and “ carried on rollers ; these traction bars I cause to move in the “ direction of their length by two or more hydraulic presses “ acting upon them. By the motion of the bars the chains are “ drawn up, and the girders and vessel are thereby raised.

" Ratchets with pawls are employed to hold up the vessel when  
 " lifted. The pumps for the hydraulic presses may be worked by  
 " a steam engine, which, as also the pumps, may be carried on  
 " the pontoons, or in an independent vessel, or on shore;  
 " they may be worked by hand or other power. Although I  
 " prefer to raise the girders in the way above described, other  
 " modes may be employed, such as giving motion to the traction  
 " bars by gearing or screws in lieu of hydraulic presses, by dis-  
 " pensing with the traction bars, and by having hydraulic presses,  
 " screws, or gearing to each transverse girder, or to each two or  
 " more transverse girders. In some of these arrangements the  
 " transverse girders might be suspended by rods instead of chains.  
 " These suspending rods or the chains instead of being taken  
 " through tubes, may be carried outside the pontoons."

[Printed, 1s. 5d. Drawings.]

A.D. 1859, May 25 — N<sup>o</sup> 1291.

PRINCE, ALEXANDER — (*a communication from Hermann Hirsch.*)—"The objects of this invention are to entirely prevent  
 " the possibility of breaking the keel (known as breaking back)  
 " of ships, and imparting to the bottoms of ships a normal form,  
 " giving a maximum of steadiness without retardation of velocity.  
 " These objects are effected in the following manner:" —"Take a  
 plane horizontal surface bounded by two arcs, the chords of which  
 give the longer axis, bearing the proportion to the shorter axis of  
 27 $\frac{1}{4}$  to 10. A circular aperture is made in the centre of the sur-  
 face, the diameter of which is one-fourth of the length of the  
 shorter axis. This aperture allows of the plane surface being  
 curved or folded or bent in such a manner, as to give the  
 peculiar form of the new ship's bottom. This form is obtained  
 by bending one-half of the major axis downwards, and the other  
 half upwards, thus giving to the edge of each arc a waved line,  
 or the "line of beauty;" the keel "being in the centre of the two  
 " arcs is prevented breaking; the bottom being formed as above  
 " described affords more room for cargo, no necessity for ballast,  
 " and prevents the ship pitching and rolling" It will be un-  
 derstood that sides of any convenient form can be attached to  
 this folded plane, which is to be considered as the bottom of the  
 ship or vessel.

[Printed, 5d. Drawings.]

A.D. 1859, May 25.—N° 1293.

DAVIS, ALBERT JOHN.—(*Provisional protection only.*)—An adjustable platform. This apparatus consists of “a slab, stage, “ or platform, provided with back and sides, or fenced with “ balustrade pieces (which fold down over it when desired), and “ resting on carrier bars or beams. When used for cleaning “ windows and such like purposes, props or brackets are attached “ to it for bearing against the outer side of the house or structure, “ and bars, legs, or props, are fitted to the carrier bars for bearing “ against the inner side of the house or structure, being adjustable “ to accommodate themselves to any dimension of ledge or other “ place, which may preferably be done by forming them with slots “ or openings, by which they slide over the carrier bars, and “ tightening them up by inserting a wedge, bolt, or key. When “ employed for military observations and certain other purposes, “ these outer brackets and inner legs (or their equivalents) may “ be dispensed with, and the apparatus provided with rings or “ other appliances to suspend it from ropes, chains, or other “ suitable agents, in order to hoist it to, lower it from, and sus- “ pend it at the required position.”

[Printed, 3d. No drawings.]

A.D. 1859, May 25.—N° 1297.

AMOS, CHARLES EDWARDS.—“The chief object of this inven- “ tion is to simplify the operation of raising vessels out of the “ water into a cradle, for the purpose of being examined and “ repaired. To this end I use a floating platform consisting of “ one or several pontoons, formed with air-tight chambers or “ compartments. When two or more pontoons are used to form “ the platform (four being the number which I prefer) I bolt the “ same securely together, and place thereon the cradle in which “ the ship to be repaired floats. Valves are provided in the “ bottom of each division of the platform for the admission and “ discharge of water. In order to discharge the water from the “ pontoons and thereby render them buoyant, I provide air- “ pumps which will throw in air at a sufficient pressure to expel “ the water through the valves in the bottom of the pontoons. “ The platform I connect by means of chains or ropes to wind-

"lasses set in action by independent engines which may also be  
 "used to drive the pumps. The engines, which I prefer should  
 "equal in number the air-tight chambers, may be mounted upon  
 "jetties," or "carried by barges or rafts secured in position by  
 "anchor moorings. By having water-tight compartments cor-  
 "responding in number with the windlasses employed great  
 "facility will be afforded in trimming the platform. The use of  
 "the windlass arrangement is to steady and ensure the equable  
 "rise of the pontoon with its load. In operating with the im-  
 "proved apparatus the pontoon is sunk and the vessel is floated  
 "over it; the windlasses are then set to work, and being regu-  
 "lated by friction couplings, a strain will be put upon the lifting  
 "chains equal to the amount of friction assigned. The pumps  
 "being meanwhile in action they will force air into the chambers,  
 "and thereby expel the water through the valves in the bottom  
 "of the pontoon. Buoyancy will thus be given to the pontoon,  
 "and, aided by the pull of the chains, the vessel will be raised  
 "out of the water. The valves, if not self-closing, are then to be  
 "closed, and the vessel may be floated to any required spot. The  
 "platform or pontoon, by reason of its construction having little  
 "draught of water, may, if required, be used to carry vessels over  
 "shoals or bars."

[Printed, 10d. Drawings.]

A.D. 1859, May 27.—No 1310.

**JACKSON, LUKE DUNCAN.**—(*Provisional protection only*)—  
 "This invention consists in "an arrangement of machinery for  
 "cutting pegs for shipping, used for corking the holes where the  
 "nails are drawn out when re-sheathed or coppered anew; splints  
 "used as pipe lights, and by congreve or lucifer manufacturers,  
 "and for better cutting of firewood." The arrangement of the  
 "machine is as follows:—"The knife is fixed on a plane angularly  
 "(as heretofore). The lance box or teeth is also placed the same,  
 "which I particularly claim as my invention, as well as the  
 "feeding box which moves the wood up to knife, and recedes in-  
 "stantly the knife has completed its cut. The machine is placed  
 "or requires to be placed when working in a vertical position, a  
 "cam or eccentric is fixed on the main shaft, a connecting rod,  
 "lever, and wedge" are "arranged to work simultaneous with each

“ other, so as to cause the feed box that carries the wood up  
“ to knife and plane in succession to accede & recede whilst  
“ cutting and going back at proper intervals.”

[Printed, 3d. No drawings.]

A.D. 1859, May 31.—N° 1339.

SMITH, WILLIAM. — (*A communication from Mr. John W. Nystrom*).—“ This invention relates to a novel construction of  
“ hydraulic pontoon or pontoon dock supplied with steam power,  
“ and capable of being steamed or propelled to the place of opera-  
“ tion. These pontoons may be sent to sea or employed in a  
“ channel way, or for harbour or dock duty, either for the purpose  
“ of raising a ship from its ordinary floating line, out of the water,  
“ without any further local preparation, for the purposes of exa-  
“ mination, repair, or removal, and in substitution of any of the  
“ existing modes of docking a ship, or for raising sunken or  
“ stranded ships, or immersed bodies, or for lifting and removing  
“ heavy weights from shore to ship, or vice versa, or from ship to  
“ ship, and for performing various other duties in and about the  
“ sea coast, harbours, rivers, and docks. It consists in forming  
“ a vessel or pontoon of suitable dimensions, somewhat like a  
“ ship of considerable breadth and small draught in proportion to  
“ her length, and constructing two hollow towers, one at the bow  
“ and the other at the stern. The vessel or pontoon is divided  
“ into a number of water-tight compartments, into which, for the  
“ purpose of sinking the pontoon or vessel, water is admitted,  
“ and from which the water has to be pumped when the pontoon  
“ and its load have to be raised. The two hollow towers are  
“ water-tight, and extend to the bottom of the pontoon, and com-  
“ munication is effected between them through a tunnel extend-  
“ ing fore and aft. In one of these towers I prefer to place  
“ the boiler and fuel stores, and in the other the steam engine for  
“ driving propeller and pumps, and also the pumping machinery,  
“ hoisting tackle, and apparatus for performing the various duties  
“ required in and about the pontoon or dock. The decks of these  
“ pontoons are constructed of great strength, suitable for support-  
“ ing the weight and strain of a ship resting thereupon, and the  
“ pontoon is strengthened longitudinally and transversely by  
“ girder bulkheads or partitions, suitably disposed for giving the

“ greatest amount of strength with the least weight. The hollow  
 “ water-tight towers are carried to a height from the deck sufficient  
 “ to enable the pontoon to be sunk to the requisite extent without  
 “ submerging the tops of the towers, and within these towers suitable staging or means of access, and arrangements for performing  
 “ the docking of ships and other purposes, as herein-before mentioned, are arranged so that the men have free access between  
 “ the towers and out at the tops of and around them; the funnel  
 “ or smoke pipe from the boiler, and the steam blow-off and other  
 “ pipes, are carried up to the top of the towers, so that no inconvenience or interruption to the working of the machinery or  
 “ performance of other operations on board will occur during the  
 “ submersion of the pontoon.” “ When the ship is of a greater  
 “ length or greater weight than can be fairly or properly borne by  
 “ one of these pontoons or floating docks, two or more of them  
 “ may be employed side by side.” “ These pontoons may be also  
 “ employed in various other ways, according to the nature of the  
 “ operation and circumstances under which they are required.”

[Printed, 11d. Drawings.]

A.D. 1859, June 2.—N° 1351.

SALTONSTALL, FRANCIS WALTER, and BUSH, ALFRED.—  
 This invention is designed for facilitating the operations of dredging and excavating. For this purpose “ we form a framework of  
 “ wood, which for excavating operations may be mounted on wheels  
 “ running on rails, and for dredging operations may be as a floating  
 “ raft. To the aforesaid framework the following parts are affixed  
 “ and connected, namely, a swing crane and platform, a scoop or  
 “ bucket of peculiar construction, a small boiler engine, wheel-  
 “ work, and winding barrel for coiling the chain around during the  
 “ raising of the unplement employed for excavating or dredging,  
 “ and a stud-wheel and chain for swinging and holding the jib of  
 “ the crane in any desired position.”

In constructing and working this excavating unplement, “ we  
 “ form a slot in the top part of the crane, about midway between  
 “ the post of the crane and the end of the jib thereof. in this slot  
 “ a spur-wheel is placed, and revolves by an endless chain passing  
 “ over stud-wheels respectively fixed on the axis of the aforesaid  
 “ spur-wheel, and the axis of another wheel situate near the platform of the crane. The aforesaid spur wheel takes into the teeth

“ of a rack fixed to a long piece of square timber, to the lower end  
 “ of which is fixed a sheet iron scoop formed with a moveable  
 “ bottom. The said scoop is suspended from the end of the jib of  
 “ the crane by a fork-shaped piece of metal hinged to the sides of  
 “ the scoop, said piece of metal carrying at its upper end a pulley  
 “ over which passes a chain which proceeds from the winding-on  
 “ barrel aforesaid, through the post of the crane, and over pullies  
 “ attached to the top of the jib thereof.” The scoop being first  
 lowered to its full extent below and behind the surface of the earth  
 to be excavated or removed, is then raised by the chain, and in so  
 doing the scoop is pulled forward, the spur-wheel being the ful-  
 crum against which the rack on the handle of the scoop abuts. In  
 this manner the scoop removes a certain quantity of earth, which,  
 when the scoop is raised sufficiently high, by the combined action  
 of the rack and spur-wheel and chains, may be discharged by  
 certain mechanism connected with the movable bottom of the  
 scoop.

[Printed, 1s. 1d. Drawings.]

A.D. 1859, June 7.—N<sup>o</sup> 1386.

CORNISH, KENNETH HENRY.—(*Provisional protection only.*)—

“ The objects of this invention are to manufacture bedsteads with  
 “ greater simplicity and economy than hitherto, and to give in-  
 “ creased elasticity to the bed,” by means of laths which are arched  
 or curved upwards, instead of straight. This arrangement is ap-  
 plicable to couches, sofas, litters, settees, chairs, and other seats  
 and reclining surfaces; also to the seats of railway carriages,  
 steamboats, and ships.

[Printed, 5d. Drawings.]

A.D. 1859, June 13.—N<sup>o</sup> 1428.

NEWTON, ALFRED VINCENT.—(*A communication from Matthias Ludlum.*)—“ Improvements in the fitting of life and other boats.”

This invention relates to such boats as are provided with floats  
 along their outsides. These floats it is preferred to construct of  
 an oblong or oval form in their transverse section. They are so  
 fitted to the boat as to secure for them a large buoyant capacity  
 within only a moderate extension beyond the sides of the boat.  
 They may be constructed of about ten separate air-tight canisters,

arranged in lines corresponding in direction with the length of the boat, and terminating so as to form elevated prow ends to the float. These canisters may be connected by a continuous brace, and the whole be held together by clasp or other bands on the outside of the float. The boat is fitted with air or water-tight lockers at each end, and at the sides, for the stowage of provisions or other articles; and water tanks are to be placed below them, for supplying water to the crew through taps or faucets. The floats are rigged to the boat in such a manner that they may either be drawn into close proximity with the sides of the boat, or be thrown out as much as their entire width from the boat. This action is secured by hanging or hinging them on hooks, screwed into the sides of the boat. "When the floats are thrown out from the side of the boat, they may have a bearing throughout their length against a shield on either side of the boat, and they may further be held from being thrown out beyond their proper limits by chains connecting the ends of either float with the boat, while the floats may be held secure against the action of the waves and from moving inwards from their set outer position by braces hinged to the floats, so as to fall of their own weight when the floats are thrown outwards, and bring into racks or notches in the sides of the boat. The floats are thrown outwards by coiled springs surrounding the one arm of guards, and acting against ears at or near the ends of either float. These guards protect the float from injury." In connection with the floats there may be an open or trelliswork railing attached to either float, and arranged to project below it. These railings not only serve to stiffen the floats and prevent their warping, but also afford foot hold for persons in the water, for whom there may not be room in the boat.

[Printed, &c. Drawings.]

A.D. 1859, June 21.—N<sup>o</sup> 1490.

GIBBS, STEPHEN.—(*Provisional protection only.*)—"This invention relates to the method of and apparatus for slinging horses and other animals on board ship, or for veterinary purposes. For slinging on board ship, or for veterinary purposes, where the animal is merely required to be slung in an upright position, the apparatus consists principally of a frame composed of four uprights and suitable transverse and longitudinal braces sup-

“ porting a bed or sling, on which the body of the animal rests,  
“ and which is capable of being raised or lowered to suit the  
“ height of the animal. The frame also supports a manger, and  
“ is provided with front and breech bars, having flanges padded,  
“ against which the fore and hind parts of the animal rest, and  
“ which are capable of adjustment, by means of chains, to the  
“ size of the animal.”

[Printed 3d. No drawings.]

A.D. 1859, June 29.—N<sup>o</sup> 1542.

NASH, JAMES.—This invention consists of an improvement upon the disengaging blocks heretofore in use, and more particularly the “safety block” for which William Clark obtained Letters Patent, bearing date 12th of April, 1859. The improvement consists, firstly, in giving a novel form to the tumbling hook, the bill of the hook being crescent-shaped, so as to be self-mousing, while the back of the hook, acting in combination with a vertical sliding bolt, is self-fastening. Secondly, in an improved method of holding and releasing the tumbling hook. “In the specification of the before-named William Clark, the method of holding the tumbling hook is described and shown to consist of a small metal plate moving laterally on a pivot attached to the stem of the block, this plate (which is called a stop or ketch)” rests against a shoulder on one side of the stem, and is kept firmly in position by a safety pin passed through a hole in the stem; this safety pin is made sufficiently long to meet the bill of the hook, and form a mousing, which prevents the cord or chain suspended from the hook from being accidentally jerked off. “In lieu of the metal plate or ketch moving laterally on a pivot, I use a bolt sliding vertically on the stem of the block, which is out of the way, and not liable to be accidentally struck up. and therefore does not require a safety pin to secure it. From the novel and peculiar form given to the back of the tumbling hook when returned to its holding position, it raises the vertical sliding bolt, which falls again by its own weight, and becomes self-fastening. On lifting the sliding bolt by means of a chain or lanyard, the tumbling hook is free to turn over in the usual manner, discharging whatever may have been suspended from it.”

[Printed, 5d. Drawings.]

A.D. 1859, July 4.—N<sup>o</sup> 1591.

**BROOMAN, RICHARD ARCHIBALD,**—(*a communication from Job Johnson.*)—Powder or mixture for refining and steelifying iron. According to this invention, take quick or caustic lime, free from earthy or foreign substances, and add to it an equal quantity of bone dust or baked bones finely divided, and a like quantity of charcoal; mix these ingredients intimately, and expose them to the influence of the weather for one, two, or more days; then take any convenient form of cementing or converting furnace, and interstratify the articles of iron to be operated upon with the mixture till the furnace is charged; afterwards close and lute with fire clay, and apply heat externally. “By this means and  
 “process I am enabled to give to iron entirely new properties and  
 “qualities, as well as” to convert or partially convert it “into  
 “steel at pleasure. Iron, subjected to this treatment, assumes great  
 “rigidity and hardness without losing its property of malleability  
 “and ductility. Shafting, piston rods, axles, journals, and such  
 “like, may be hardened and strengthened by an exterior coating  
 “of steel, possessing all the properties of cast steel, whilst the  
 “interior retains all its fibrous structure. In like manner, rail-  
 “way bars, wheels, chains, anchors, anvils, and large articles  
 “generally may be hardened and strengthened to any required  
 “extent, whilst smaller articles” “may be finished in iron, and  
 “then converted, or partially converted, into steel, without im-  
 “pairing their forms or requiring reconstruction. This process  
 “also gives to iron the property of resisting oxidation in a high  
 “degree, and amongst other things is most important in its  
 “application in preparing plates for shipbuilding, boilers, bridges,  
 “and other like purposes.”

[Printed, 4d. No drawings.]

A.D. 1859, July 7.—N<sup>o</sup> 1613.

**KNOWELDEN, JOHN, and EDWARDS, DOWNERS.**—“Im-  
 “provements in hydraulic engines and pumps, and the employ-  
 “ment of apparatus for applying motive power.” The improve-  
 “ments consist “in so constructing or arranging hydraulic engines  
 “and pumps that the water to be pumped or employed does not  
 “come in contact with the piston and cylinder or barrel in which  
 “it works. We effect this by means of a chamber placed between

“ the valves and the cylinders, and within this chamber we place  
“ a diaphragm made of elastic material. The space between the  
“ diaphragm and the piston or ram may be filled with water, oil,  
“ or any suitable liquid, and as the piston or ram is moved,  
“ so will the diaphragm be raised or depressed.” Also “in the  
“ arrangement of two opposite cylinders and pistons set in a  
“ pair or pairs with their rods connected to one crank, the space  
“ between the pistons being formed into a chamber. When the  
“ crank is at right angles to the cylinders; the pistons are nearer  
“ to each other than when the crank is perpendicular, thus causing  
“ each piston to be double acting; there is one inlet and one  
“ outlet valve or clack to each cylinder and to the chamber, and  
“ the apparatus may be enclosed in a double jacket or casing; or  
“ pipes may be attached to the valves in a single casting.” And  
further “in placing an air chamber between the cylinder bottom  
“ or cover and the piston of hydraulic engines, and we effect this  
“ by attaching a disc or diaphragm of some elastic material, so as  
“ to leave a chamber of air between such diaphragm and the  
“ cylinder bottom or cover.

“ In order to economize the water in working our engines for  
“ hauling, hoisting, lowering, &c., we adjust the weight to be  
“ moved proportionate to the pressure on the crank pin by em-  
“ ploying an expanding or contracting or changeable drum or  
“ barrel upon which the chain or rope is to be wound.

“ In applying portable hydraulic engines for motive power for  
“ various purposes, we employ flexible pipes or tubing to supply  
“ the water, by which means we can employ ” “ such engines for  
“ loading or unloading, hauling, hoisting or lowering in ships or  
“ warehouses, or buildings, or quays, or for pile-driving or pump-  
“ ing, or working railway brakes; also for working agricultural  
“ machines and implements, and other purposes.”

[Printed, 10d. Drawings.]

A.D. 1859, July 8.—N<sup>o</sup> 1629.

HARFIELD, WILLIAM HORATIO.—“ This invention has for its  
“ object improvements in ships’ capstans and riding bits. In  
“ constructing capstans it has been usual to form the barrel and  
“ head of the capstan of wood, or in some cases cast iron has  
“ been employed. Now, according to my invention. I construct

“ the barrel and head of wrought iron, and by so doing I am  
 “ able to construct a capstan more cheaply than when wood is  
 “ employed, and which is much superior to a cast-iron capstan,  
 “ particularly for use on board a ship of war.” “ In constructing  
 “ a capstan, I mount on the vertical axis at the top and bottom  
 “ of the capstan,” bosses of cast or wrought iron. The head of  
 the capstan is formed by bolting wrought-iron plates to the top  
 and bottom of the top boss; between these plates the recesses for  
 the bars are formed, by introducing wrought-iron filling pieces at  
 intervals. The inner ends of these pieces are securely held in  
 notches formed for them in the boss, and at their outer ends they  
 are bolted through the top and bottom plates of the head. To the  
 boss at the bottom of the capstan, a plate of wrought-iron is  
 bolted; this plate has a flange bolted to its edge, which carries  
 the pawls. The barrel of the capstan is formed of boiler plate  
 and angle iron, and is secured to the top and bottom bosses by  
 bolts, which pass through the lower plate of the head, and the  
 bottom plate of the capstan. It is furnished with whelps, which  
 may be of wrought-iron, wood, or brass. When the capstan has a  
 chain flange, this takes the place of the lower boss and bottom  
 plate. “ I also ” “ construct riding bits of wrought-iron in place  
 “ of wood or cast-iron as heretofore. I form a cylinder of boiler  
 “ plate closed at the upper end, and formed with flanges at its  
 “ lower end, by means of which it may be firmly fixed in its  
 “ position in the ship. On to this, I shrink rings of wrought-  
 “ iron, which take the wear occasioned by the cable passing round  
 “ the bit in running out; these rings may be renewed when  
 “ necessary. The riding bit is furnished with projections to keep  
 “ the coils of cable placed around the bit apart. these projecting  
 “ pieces are of wrought-iron, they are fitted into holes made in  
 “ the sides of the riding bit, and secured by keys or otherwise.”

[Printed, 10d. Drawings.]

A.D. 1859, July 11.—N° 1648.

DIBLE, JAMES, and GRAVELEY, WILLIAM HENRY.—[Im-  
 provements in apparatus for ventilating and lighting ships. “ This  
 “ invention refers chiefly to improvements upon an invention  
 “ of James Dible, patented the 2nd November 1852, N° 612, but  
 “ is applicable to other ventilating apparatus where a shaft rising

“ above deck is used.” The present invention consists in surrounding the shaft from the deck to, say, from one to five feet, with a cylindrical case somewhat larger than the shaft, and having the annular space between them covered with a glazed top, capable of sliding up the shaft, for the purpose of allowing the escape of foul and vitiated air, while the glass in the top allows of light entering between decks. “ We fit a valve in the interior of the shaft, and provide an india-rubber or other like suitable seat in order to prevent the ingress of the sea in heavy weather; over the seat we fit a plug to draw off any water that may rest on the valve.” “ For yachts and small vessels we sometimes make the bell mouth to fold.

[Printed, 6d. Drawings.]

A.D. 1859, July 12.—N° 1652.

LUIS, JOZÉ. — (*A communication from Bernard Joachim La Mothe.*)—“ Improvements in railway car seats and arm chairs.” “ My improvements in the construction of seats or chairs of all descriptions for rooms, railway carriages, or vessels, render them perfectly comfortable either for home use or travelling, and consist in making the back of the chair moveable, so as to take a position more or less sloping, at the desire of the person making use of the seat.”

[Printed, 7d. Drawings.]

A.D. 1859, July 18.—N° 1695.

HARFIELD, WILLIAM HORATIO.—“ This invention has for its object improvements in apparatus employed in getting ships’ anchors, and in shackling chains. Heretofore when chain messengers are employed, the messenger has usually been worked with a capstan having a spike or toothed wheel mounted on it, the spikes or teeth of which enter every other link of the chain; this arrangement renders it impossible to employ a messenger chain having stayed links”; and chains, the links of which are not stayed, are very liable to stretch, and when stretched are useless, as they will no longer work properly with the spike wheel of the capstan. But according to this invention, “ the capstan is fitted with a chain flange, such as is commonly made use of on capstans for working with chain cables, that is to

“ say, the flange is made with a groove in which the chain lays,  
“ and on the sides of the groove stops are fixed, which enter  
“ between the vertical links and over and below the horizontal  
“ links of the chain; this capstan is combined with an endless or  
“ messenger chain, the links of which are stayed, as has heretofore  
“ been practised in other chains, and I connect up the  
“ chain so as to make it endless by means of a shackle made of a  
“ form corresponding with a link of the chain, but divided into  
“ two parts longitudinally; these parts are made to fit together  
“ with dovetails, and the parts are prevented from sliding apart  
“ when in use by a pin, or the two parts of the shackle may be  
“ otherwise connected together; this shackle corresponding in  
“ form with the links of the chain passes very readily round the  
“ capstan when at work.”

“ In place of this arrangement the ends of the messenger chain  
“ may be connected by means of a pair of shackles made to rove  
“ through each other, in place of by a single shackle, as is usually  
“ employed for shackling chains.” “ By using a pair of shackles I  
“ avoid the use of enlarged links at the end of each length of  
“ chain as such enlarged links are required when a single shackle  
“ is employed, in order that the curved part of the shackle may be  
“ able to pass through the link; but when a pair of shackles are  
“ employed, the pin of each shackle passes through links of the  
“ chain, and the curved part of one shackle is rove through the  
“ curved part of the other shackle; the shackles are made of  
“ the same length as the links of the chain, so that they may pass  
“ freely round the capstan.” “ In some cases I employ, in place  
“ of a pair of shackles, a double shackle having a pin at each end  
“ to pass through the links of the chain.” These methods of  
shackling are applicable to other chains as well as to messenger  
chains, and it will be seen that if a chain breaks, it may thus be  
shackled up at any point in its length; whereas, with ordinary  
shackles, it is only at the enlarged links that shackles equal in  
strength to the chain can be introduced.

“ In order to connect the chain cable of the anchor to the  
“ messenger chain, in place of employing rope lashings, as is  
“ usual, I make use of a pair of claws, one of the claws fits on to  
“ the messenger chain, and the other on to the chain cable; these  
“ claws are each furnished with a projecting pin, and by lashing  
“ the pins of the two claws together, the chain cable is connected

“ to the messenger much more conveniently than heretofore.”  
The messenger should be of such a length as to allow of three pairs of claws being on at a time.

[Printed, 7d. Drawings.]

A.D. 1859, July 23.—N° 1726.

**HARFIELD, WILLIAM HORATIO.**—This invention has for its object improvements in capstans, riding bits, and stoppers for working with chains. In constructing capstans for working chains, they are now commonly fitted with chain flanges, made according to the specification of the patent granted to Thomas Brown, and dated 20th of April, 1847, N° 11,666. Each such flange consists of a circular casting, with a hole through the centre through which the axis of the capstan passes; and in the edge of the casting, and passing all round it, a groove is made. When the capstan is in use, the chain lies in the groove, entering it to a greater or less depth according to its size. In order to prevent the chain slipping round in the groove, radial stops are placed at intervals on its inclined sides, and these stops by entering between the links which stand in a vertical position, hold the chain firmly. The space between the stops being such as not to allow the vertical links to pass through, they allow those links which lie flat or in a horizontal position to pass freely between them. Now chain flanges constructed in this manner, although they work very well with chains of different sizes and of the same proportions, do not work so well with chains of different proportions. “ To obviate this inconvenience, in place of casting  
“ the stops, the inclines and the other parts of the flange in one  
“ piece, as has been usual heretofore, I form each stop on a  
“ separate piece usually of wrought iron, and it is preferable  
“ that a portion of the incline on each side of the stop should be  
“ formed in the same piece with it. These separate pieces are  
“ arranged to slide in guides to and from the centre of the cap-  
“ stan. Each of these pieces is furnished with a projecting  
“ piece, which enters a slot in the top or the bottom plate of the  
“ flange, and filling pieces are employed, and by placing one or  
“ more of these between the projecting pieces and the end of the  
“ slot, the stop may be brought to any desired distance from  
“ centre, and by thus adjusting the stops, the capstan may be

" made to take conveniently chains of different sizes, and also of  
" different make or proportions. In constructing capstans to  
" work with chain cables, I sometimes fix on the lower part of the  
" capstan or on its post or axis, a bevilled toothed wheel, and I  
" let into the deck, one on each side of the capstan chain, over  
" the chain lockers, holders or wheels; these are each mounted on  
" a horizontal axis, which also has fixed on it a bevilled toothed  
" wheel, and in order to communicate the motion of the capstan  
" to the chain holders or wheels, there is a stud or axis fixed in  
" the deck on each side of the capstan, which receives a pinion  
" gearing both with the bevilled wheel on the capstan or its post,  
" and with the bevilled wheel on the axis of the chain holder or  
" wheel. The pinion is so arranged that it can at pleasure be  
" removed from its stud or axis, and by so doing, the chain  
" holder or wheel is thrown out of gear with the capstan. Thus,  
" the capstan may be worked in conjunction with one or other of  
" the chain holders or wheels as may be desired, or they may  
" both be thrown out of gear. In some cases I fix two bevilled  
" wheels on the capstan or its post, and also two bevilled wheels  
" on each of the axes of the chain holders or wheels, so that by  
" introducing pinions of different sizes between the capstan and  
" chain holders or wheels, the speed of the gearing may be  
" changed. The two chain holders or wheels are mounted on  
" separate axes to allow of their being more conveniently let into  
" the deck."

The invention also relates "to the arrangement or construction  
" of riding bits and stoppers, and consists in constructing the  
" same in the following manner:—In an iron casting of a rect-  
" angular form, which is fixed to the deck of the ship, there is a  
" vertical groove passing from the top some distance down the  
" casting, and from end to end of it. This groove is of such a  
" width as to allow the chain to run freely through it. The  
" bottom of the groove is made hollow lengthways, that is to say,  
" it is deeper in the centre of its length than at its two ends, and  
" the bottom of the groove has a notch or smaller groove formed  
" in it from end to end of the main groove, to allow the vertical  
" links to bed, so that the horizontal links may lay on the bottom  
" of the main groove. In the groove and over the chain a block  
" is fitted, the lower edge of which is convex and made to the  
" same curve as the bottom of the groove in the casting, and it is

“ notched in the same manner as the bottom of the groove. The  
 “ block is fitted with a screw, by means of which or by other  
 “ mechanical means it can be worked up and down in the groove  
 “ in the riding bit. When the block is at the top of the groove,  
 “ the chain runs straight through the groove, and no resistance is  
 “ offered to its passage, but when the block is forced down, the  
 “ chain is more or less deflected out of the straight course, and  
 “ more or less resistance is offered to its running out. In order  
 “ to hold the chain when a sufficient length has run out, a fork  
 “ is employed on the inboard end of the riding bit; this fork is  
 “ capable of being raised and lowered by a rack and pinion, and  
 “ when it is lowered the fork fits over one of the vertical links,  
 “ and it prevents the next horizontal link entering the groove in  
 “ the riding bit. The fork is hinged to the piece which carries it,  
 “ so that when the chain is hove in, the stop clears itself by  
 “ turning on its hinge joint, and it drops as a pawl into each of  
 “ the spaces between the horizontal links of the chain.” “ When  
 “ the ship is riding by the bit, a turn of the cable may be taken  
 “ round it as when an ordinary riding bit is employed.”

[Printed, 1s. 5d. Drawings.]

A.D. 1859, July 29.—N° 1763.

**TERRELL, THOMAS JOSEPH.**—(*Provisional protection only.*)—  
 This invention consists “in cutting or otherwise forming a worm  
 “ on the lower part of riding bits and ‘timber heads,’ for the  
 “ chain or rope to run in for the purpose of preventing the same  
 “ running off, and for preventing one coil riding over another.  
 “ The term ‘timber heads’ applies to the posts or uprights round  
 “ which ropes or chains are passed in paying out and otherwise  
 “ on board ship, and comprises posts whether of wood or metal.  
 “ I find it preferable to cause parts of the worm to project beyond  
 “ the circumference of the remaining part of the bit or head.”

[Printed, 3d. No drawings.]

A.D. 1859, August 4.—N° 1800.

**CORDNER, EDWARD JAMES.**—The invention consists “in  
 “ applying to the saving of life and property from shipwreck and  
 “ to other purposes a set or succession of kites, or several com-  
 “ bined sets of kites so arranged and combined that the power

" exerted by the several kites of a set shall be exerted at one point,  
" or upon a single line, rope, or chain." The kites are generally  
of a hexagonal shape covered with calico, linen, or other material,  
and are so constructed as to pack into convenient sized boxes.

The invention is also applicable "to various other purposes,  
" such as the propulsion of vessels in conjunction with sails or  
" steam, to the raising of sunken ships, or indeed to almost any  
" purpose where a nearly unlimited power of traction or elevation  
" is required."

[Printed, 3d. No drawings.]

A.D. 1859, August 9.—N° 1835.

DUNN, THOMAS.—"Improvements in machinery and apparatus  
" for elevating and regulating the level and flow of liquids, part  
" of which is applicable for propelling vessels." The improve-  
ments "in machinery and apparatus for elevating fluids, consist  
" in certain improved modes of constructing endless chain pumps.  
" A chain of balls or cylinders, made of wood or other material,  
" is put in motion, either in a vertical or diagonal position, one  
" side of the chain works within the pipe or tube through which  
" the fluid is raised, while the other side descends free. These  
" endless chains are also applicable to propelling vessels, and  
" they may be applied to the stern or along the keel, or any part  
" of the length of the vessel. When applied along the keel, the  
" vessel in shallow water or on banks, may be rolled forward on  
" the cylinders of the propellers, or on rollers independent of the  
" propellers.

"My improvements in machinery and apparatus for regulating  
" the level and flow of liquids, are as follows. When water or  
" other fluid has been elevated into a cistern by means of the  
" improved machinery above described or otherwise, the fluid is  
" kept to the same level by a float fitting loose on the spindle of  
" a valve. This last part of my invention is also applicable to let  
" off water from steam pipes. In this case the valve is placed in  
" the off pipe, and the float is contained in a vessel in which the  
" water accumulates, consequently when there is enough water  
" to lift the float the valve is opened to allow the water to run off.  
" The level and flow of fluids can also be regulated by a graduated  
" weighted lever connected to a valve. When the pressure of the

“ fluid is sufficiently great to raise the valve, the fluid will flow  
“ through the valve until the pressure is reduced to the point  
“ fixed upon.”

Another part of the improvements “in machinery or apparatus  
“ for elevating fluids, consists in making the pump barrel to move  
“ to and fro on the feed and discharge pipes, which are furnished  
“ with feed and delivering valves. By this means a double-acting  
“ pump is obtained with a single pump barrel.”

[Printed, 1s. 4d. Drawings.]

A.D. 1859, August 24.—N° 1935.

RUSSELL, DANIEL, and RUSSELL, JONATHAN.—This invention for improving the means of docking and lifting ships out of the water, for various purposes, consists in the employment of a number of hollow pontoons or decked barges, connected together side by side by ropes, chains, or other means, forming collectively a dock or float of sufficient length and capacity to carry the ship requiring to be docked or lifted out of the water. Also, in providing at each end of every pontoon a hollow chamber, called a regulating float chamber, built on the deck of the pontoon, and rising to the height of 20 feet or more, as may be required. By means of ordinary valves or cocks, water is admitted into the pontoons to sink them, and water can also be admitted into the hollow chambers to regulate the sinking and level of the pontoons. The pontoons being sunk, and the ship brought over them, the water is removed from the pontoons and hollow chambers by means of suitable pumps. The inventors also describe a sliding pontoon, constructed in two pieces, and united with sliding timbers or plates, “each alternate timber or plate being secured to  
“ the opposite half of the pontoon, the timbers and plates being  
“ properly fitted to slide in grooves and cavities side by side  
“ under the bottom of each pontoon.”

[Printed, 7d. Drawings.]

A.D. 1859, August 26.—N° 1947.

GRUNDT, HERRMANN.—(*Provisional protection only.*)—“Im-  
“ provements in life-boats.” “In constructing life-boats accord-  
“ ing to my invention, I form the keel of the boat hollow, by  
“ preference of sheet brass or of the hard material obtained from

“ india rubber. The stern post and the cutwater of the boat are  
“ also made hollow; they are in one piece with the keel and of  
“ the same material. The ribs of the boat, which are also made  
“ hollow or tubular, and by preference of the same material as the  
“ keel, run from end to end of the boat, and are each jointed at  
“ one end to the stern post and at the other end to the cutwater,  
“ and are free to turn on the joints at their ends; thus it will be  
“ seen that when desired the frame of the boat can be folded flat  
“ by turning the ribs down towards the keel. Both the keel and  
“ the parts connected with it, and the ribs of the boat, are made  
“ water-tight so that they may add to the buoyancy of the boat.  
“ The frame of the boat is covered either with vulcanized india-  
“ rubber, with waterproof fabric, or other suitable flexible material;  
“ this covering is connected with the ribs and is made double,  
“ and the space between the two parts of the covering is filled  
“ with air when the boat is in use, and at this time the frame is  
“ kept distended by the seats of the boat, which serve as stretchers.  
“ When the boat is out of use and the frame is folded flat,  
“ the skin or covering also folds, the air being then allowed  
“ to escape from between the parts of the double covering.”

[Printed, 3d. No drawings.]

A.D. 1859, August 29.—N<sup>o</sup> 1961.

KERMAN, CHARLES. — (*Provisional protection only.*) — “ An  
“ apparatus to prevent the sinking of vessels through leakage, for  
“ lifting and floating vessels off when stranded, and for raising  
“ and floating sunken vessels.” The apparatus consists mainly  
of a vessel or vessels of suitable form, composed of vulcanized  
india rubber, or other suitable material of an air-tight and water-  
proof texture, and made hollow so as to contain air. One or  
more of these air-tight vessels are intended to be inserted in  
a collapsed or empty state, between the decks or in the hold of  
the vessel to be operated on, and then inflated by means of  
an air pump.

[Printed, 3d. No drawings.]

A.D. 1859, August 30. — N<sup>o</sup> 1969.

BARNES, JOHN BOWEN, and LOACH, JOHN. — “ Certain im-  
“ provements in oars for impelling boats, as also in the rowlocks

“ in which they work.” The improvements consist first, in the general construction of oars, with their several parts and rowlocks, by which, in the act of rowing, the outer part or blade shall move backward or forward in the same direction in which the inner or handle part may be moved, by which means the rower will be enabled to sit facing the direction in which he may wish to impel his boat.

Secondly, in the application to oars of a feathering blade. For this purpose the oars are formed in two parts, fitted with suitable sockets or shanks, in connexion with segmental toothed wheels, which are geared together, and secured by pins to an outer case or box. On this case or box, axes are formed, to rest in the rowlocks, thus freely admitting the oar to be raised from or dipped into the water as required, by the depression or elevation of the hand, and by the segmental toothed connectors.

[Printed, 10d. Drawings.]

A.D. 1859, September 9.—N° 2059.

ALLEYNE, JOHN GAY NEWTON.—The invention consists in the manufacture of wrought iron beams, composed of a web with a flange or flanges, or a bead or beads, or a projection or projections, at one or both sides of one or both of its edges, by welding together two or more wrought iron bars, with the intervention of one or more small bars of iron denominated gluts, which gluts are iron bars rolled with two opposite grooves, so as to resemble the letter H. By this means the edges of the bars are protected from excessive oxidation during the process of manufacture.

[Printed, 10d. Drawings.]

A.D. 1859, September 17.—N° 2116.

LUIS, JOZÉ.—(*A communication from Gallois Foucault.*)—The object of the invention is, by means of a self-ringing bell, to give notice of the approach or position of vessels, and so to prevent collisions at sea; and also to signal the whereabouts of sands, sunken rocks, and other dangerous vicinities. The apparatus consists of a bell supported on an iron rod, surmounted by four arms placed at right angles, and having at each end a moveable

hammer or clapper so attached that at the least oscillation the hammers may strike the hell.

In case of a complete absence of motion of the ship, the clappers may be put in motion by a set of pullies.

[Printed, 6d. Drawings.]

A.D. 1859, September 29.—N° 2202.

**STEVENS, CHARLES.**—(*A communication from Yollet, Bahin and Gâche aîné.*)—"An improved steam dredging boat." The vessel or boat is of ordinary size, and is divided into eight compartments, the bottoms of which are above water mark when empty, and are in communication with the sea by means of wells furnished with valves, on the raising of which the mud of all the compartments can be at one and the same time emptied. A steam engine placed in the boat, moves alternately the shaft of the screw (by which the boat is moved from place to place), and another shaft passing beneath the mud compartments. This latter shaft has at one end a pinion gearing with two wheels, each of which is furnished with a crank pin on which a main connecting rod is coupled. These rods serve to move the balance beams to which the connecting rods of the pump pistons are attached. The bottoms of the pumps are in connection with suction pipes, by means of knee or joint pipes, permitting the "wallower or core barrel" of the tubes to be lowered, by means of a windlass, to a depth of about 36 feet, for the mud is to be pumped up above the water, and then when the vessel is loaded it carries it off to the sea. Pipes or troughs are arranged so that the mud runs into the different compartments. Thus this vessel combines the two operations, that of dredging or pumping up the mud, and the transporting of it to a convenient place for emptying, where by means of valves it can at once be discharged. The adaptation of movable suction pipes forms the basis of the invention.

[Printed, 1s. 6d. Drawings.]

A.D. 1859, September 29.—N° 2203.

**PAGE, GEORGE GORDON, and LUNGLEY, CHARLES.**—"This invention relates to the class of ladders called step ladders or "gangways, which are more particularly applied to ships, landing

“ piers, and other floating bodies, to which they are hinged on or  
“ are otherwise attached, where a variation in the level of such  
“ bodies necessarily entails a variation in the angle of the step  
“ ladder, and consists in so constructing the treads or steps that  
“ they may always maintain their horizontal position whatever be  
“ the angle at which the step ladder may be placed. And this is  
“ effected by attaching to each end of each tread or step, either at  
“ the centre or otherwise of its width, a pivot working in a bush  
“ or socket upon which the tread or step is supported, and round  
“ which it turns freely; also in attaching to each tread or step a  
“ lever or arm, which is connected by a pin or stud to a rod, bar,  
“ chain, or rope extending the whole length of the ladder occupied  
“ by the steps, and to which every tread or step is attached. One  
“ end of the rod, bar, chain, or rope is jointed or similarly attached  
“ to the fixed part of the framing from which the step ladder is  
“ suspended or to which it is otherwise united. By means of  
“ this rod, bar, chain, or rope the whole of the treads or steps are  
“ moved simultaneously in the manner of a parallel ruler. The  
“ same object may be attained by attaching two rods, bars, chains,  
“ or ropes to the treads or steps by pins or studs in the manner  
“ of a Venetian blind.”

[Printed, 7d. Drawings.]

A.D. 1859, October 12.—N<sup>o</sup> 2328.

MOODY, CHARLES PETERS.—“ A method of and apparatus for  
“ raising grass and other crops on to stacks, which apparatus is  
“ also applicable to raising and transferring weights.” “The  
“ apparatus consists of two side frames, which are connected by  
“ cross bars. These frames may be on wheels or not, as desirable,  
“ moving on stout pins or studs; near the bottom of the side  
“ frames there are four bars or jibs, two on each side, similar to  
“ the jib of a crane; these bars or jibs are connected by a strong  
“ cross-bar. Upon one of the other cross-bars which connect the  
“ side frames, I mount two winding pulleys and a drum or large  
“ pulley to which the horse or other power is to be connected,  
“ and on which I wind a rope or chain. The winding pulleys are  
“ placed one at each side of the apparatus, and each has con-  
“ nected to it a rope or chain, which ropes pass over two guide  
“ pulleys on the top cross-bar connecting the top of the uprights

“ of the side frames, and are carried over them and attached to  
 “ the cross-bar of the jibs, which we will suppose to be lowered  
 “ and extended out over the ” “ weight to be raised, in which  
 “ position the ropes will be unwound from, yet still attached to  
 “ the winding drums.” Chains depend from the cross-bar of  
 the jibs, which are hooked on to the weight to be raised. In all  
 farming operations horse power will generally be found the most  
 convenient; therefore, when the cradle fitted within the waggon,  
 and filled with grass or other crops, has been hooked on to the  
 chains, “ I connect a horse to the power rope, and as soon as he  
 “ draws, the power rope is rolled off, and the winding ropes are  
 “ rolled on their respective pulleys, whereby the jibs lift the cradle  
 “ out of the wagon, carry it up, and transfer and deposit it on  
 “ to the side of the stack or place where the stack is to be formed.”  
 “ Among the many purposes to which my apparatus may be  
 “ usefully applied, I may mention that of taking heavy weights  
 “ from barges and other vessels and transferring them into carts,  
 “ in such cases it may be desirable to have ” two “ connected  
 “ jibs only, one in each side frame instead of two.”

[Printed, 10d. Drawings.]

A.D. 1859, October 20. —N<sup>o</sup> 2404.

HODGSON, JAMES.—“ This invention has for its object im-  
 “ provements in building ships and vessels. For these purposes,  
 “ in constructing bulkheads of iron or steel plates in ships and  
 “ vessels, in place of connecting their edges to the frames of the  
 “ ships or vessels as heretofore, I form the edges of a bulkhead  
 “ double, in such manner that the plates of which the edges of a  
 “ bulkhead are formed may be placed at an angle to each other,  
 “ and spread out so that the edges of the two series of plates  
 “ may be rivetted to two of the angle iron or steel ribs or frames  
 “ of the ship or vessel,” and such two angle iron or steel ribs or  
 frames may either be adjacent to, or at a distance from each  
 other. By this means there will be an angular space enclosed  
 around a bulkhead, which will give stability to the ship or vessel,  
 as well as to the bulkhead.

The inventor also describes, but only in the provisional specifi-  
 cation, the following improvement: viz., in constructing “squarish  
 “ ended or very bluff ended ships and vessels, suitable for floating

“ batteries, for gun boats, for dredging, and for other uses, I, in  
 “ order to enable them to steer with facility, increase the length  
 “ at the after end or at the after and fore ends of each such  
 “ vessel by applying thereto a triangular-formed chamber of sheet  
 “ iron or steel, in such manner that the base end of the triangular  
 “ chamber may be bolted or attached to the after or fore end of  
 “ the very bluff or squarish ended vessel, and have the rudder  
 “ hung to the after end of the triangular chamber; and for gun-  
 “ boats, floating batteries, and some other vessels, the triangular  
 “ chambers may be arranged to be readily detached from and  
 “ re-attached to the end or ends of the vessel, in order that the  
 “ triangular chambers and rudders may be out of the way when  
 “ desired.”

[Printed, &c. Drawings.]

A.D. 1859, October 21.—N° 2411.

PRIDEAUX, THOMAS SYMES.—“ Improvements in the con-  
 “ struction of ships and rafts.” “ This invention has for its  
 “ object to accelerate the speed and increase the strength and  
 “ stability of ships by improving the form of the hull, making it  
 “ shot proof, lightening the weight of the masts and spars,  
 “ and employing the ejection of water or a submerged paddle  
 “ wheel” or paddle wheels “ at the middle or fore part in combina-  
 “ tion with a propeller at the stern as a means of propulsion;  
 “ also to provide them with portable rafts, easily put together  
 “ and capable of being advantageously substituted (for many  
 “ services) for a portion of the boats at present carried, the  
 “ space for which will be curtailed by the shortening of the upper  
 “ deck.”

“ To promote the motion of a ship through the water in a right  
 line, and prevent oscillation or pitching as her motion is  
 accelerated or retarded, “ it is desirable that the shape of  
 “ the bow be such as so to divide the force of resistance of the  
 “ water opposing its passage as to cause it to deflect the bow  
 “ from the axis of motion equally in all directions, that thus the  
 “ pressure on every side being balanced there may be no influence  
 “ exerted on the bow tending to divert the ship from her true  
 “ course. This object is to be obtained by making the bow  
 “ conical, with the point of the cone about  $\cdot 6$ , or from  $\cdot 7$  to  $\cdot 5$  of

“ her depth of immersion (not including the keel) from the  
“ surface. This conical form of bow has also another advantage,  
“ vizt, that the angle which divides the water is more acute.”  
“ On each side, behind the conical bow, I construct chambers, to  
“ which the water is admitted from the exterior, and forcibly  
“ ejected at the bottom or sides backwards in a line with the keel,  
“ thus acting, in combination with the stern propeller, to accele-  
“ rate the speed of the ship. This most important point, parti-  
“ cularly for purposes of war, the steadiness of ships, may be still  
“ further increased by the addition of plane surfaces attached to  
“ their sides at about the level of the point of the (cone) bow,  
“ forming lateral fins, and also by diminishing the weight aloft,”  
“ to do which, without lessening the strength of the masts  
“ and spars, I substitute corrugated iron or steel tubes in place  
“ of the wooden or common sheet iron masts and spars in use  
“ at present.”

To secure the sides of vessels from shot, by means of plating  
them with iron, “ I surround the plates of iron or steel with  
“ a hempen sacking or some substance equivalent in its effect in  
“ destroying sonorous vibrations, with an additional cushion  
“ stuffed with wool, horsehair, steel wire, or any other suitable  
“ elastic material on the front side, which cushions may be  
“ encased in thin copper sheathing, to prevent their unbuming  
“ water.” “ The plate is affixed to the vessel’s side by bars of steel,  
“ forming powerful springs; or, I use compound plates, formed of  
“ a number of small plates or bars arranged edgeways or side by  
“ side, with a layer of hemp, wool, hair, cork, or any equivalent  
“ elastic material between each, pinned together and fastened into  
“ a frame, so as to form one block.”

In constructing portable rafts, “ I employ ” “ a light framework  
“ of wrought iron or steel, capable of being quickly screwed and  
“ braced together, and forming, so to speak, the skeleton of the  
“ raft. Within this framework, and surrounded and protected  
“ by it, I place a double tier of caissons or vessels, to give  
“ the requisite power of floatation. These caissons may be made  
“ of thin sheet metal, with diaphragms soldered in the interior,  
“ dividing each into ” two, three, four, or more, “ if thought de-  
“ sirable, air-tight chambers; or, where it is required to stow  
“ away the portions of the raft in still smaller space, the caissons  
“ may be constructed of waterproof cloth, and fitted with stop-

“ cocks, so as to admit of being emptied, and refilled with air at  
“ pleasure, and will thus be capable, when not inflated, of being  
“ rolled up and stowed away in a very small compass. For the  
“ framework of the raft, I prefer to employ corrugated iron or steel  
“ tubes, as combining the greatest lightness with the greatest  
“ strength, but angle iron, or any other light form of iron  
“ girder may be substituted.”

[Printed, 1s. 7d. Drawings.]

A.D. 1859, October 24.—Nº 2431.

NEWTON, WILLIAM EDWARD,—(*a communication from Rollin Germain.*)—“ Improvements in the construction of ships or  
“ vessels.” These improvements consist, first, in making the  
cut-water and stern part of the vessel exceedingly sharp, in other  
words, “ the track of the vessel through the water is opened by  
“ surfaces inclined exceedingly near to the line of movement, and  
“ the water is permitted to close in after the vessel along surfaces  
“ inclined exceedingly near to the line of movement.” In these  
vessels “ the relative proportions as to length, breadth of beam,  
“ and draught of water shall be such, that if a right line be drawn  
“ longitudinally through the middle, commencing at the water  
“ line at the bow, and terminating at the water line at the stern  
“ (when the vessel is loaded,) and another line be drawn at right  
“ angles to the said line along the water surface from the water  
“ line on one side to the water line on the other side at the middle  
“ of the part of the vessel where a cross section below the water line  
“ is greatest, and from every point in this last described line right  
“ lines be drawn to each end of the first described line the average  
“ of all the angles made by these last lines with the first described  
“ line shall not exceed two degrees.” The exterior parts of the  
vessel which move through the atmosphere, including smoke pipes,  
pilot houses, and so forth, are “ of a lenticular form,” that they  
may present sharp edges fore and aft.

Also “ in adapting a V-shaped fin-like projection along the  
“ sides of the vessel below the water line, in order to augment  
“ the floating power of the vessel, and increase its steadiness.”

In “ the adaptation and use of the extreme after part of the  
“ vessel for the purposes of a rudder.” And, further, in “ joining  
“ the metallic plates, knees, ribs, &c., used in the construction of

“ the vessel so that they shall hook or lock together, and be as  
 “ strong at the fastenings as at any other part thereof, and at the  
 “ same time present a smooth and even exterior surface. The metal-  
 “ lic plates used in the construction of the vessel are made thicker  
 “ at their lapping ends than at the middle, to compensate for the  
 “ waste of rivet holes and notches, and insure as much strength  
 “ at their connections as at other parts; a series of notches are  
 “ made in each plate, so that when the plates are brought together,  
 “ the notches may clutch and hold together, and relieve the strain  
 “ upon the rivets;” or the plates may be made to hook together,  
 by means of a simple step or hook; or the junction of the plates  
 may be effected by “ constructing the ends of the plates with  
 “ notches which do not overlap each other, but the iron knee is  
 “ correspondingly notched, so that the plates and knee clutch  
 “ together, the knee operating to bind and hold the plates to-  
 “ gether.”

Overhanging decks project from the sides of these vessels to the same extent as the fin-like projection in the water. In the space between these parts, the propellers or paddle wheels work, any number of which, with the engines necessary to obtain the requisite power and speed, may be used. The sides and top of the vessel should be as high in the middle parts as steadiness will permit, sloping inwards and downwards along the narrow extremities, so as to present to the atmosphere surfaces slightly oblique to the line of motion.

[Printed, 11d. Drawings.]

A.D. 1859, November 1.—N<sup>o</sup> 2491.

**JONES, JOSIAH, junior.**—Improvements in ship-building, applicable in the construction of ships for the purposes of war, which are required to be shot-proof. “ For this purpose, I so construct  
 “ the ribs or framing of the ship that the sides or ends of the ship  
 “ formed when the ribs or framing is plated or planked over  
 “ shall be considerably inclined; and on to such inclined sides  
 “ I afterwards fix thick protecting plates of metal.”

By this means a structure is obtained “ which will resist shot  
 “ much more effectually than the floating batteries hitherto con-  
 “ structed, in which the sides being vertical, or nearly so, the  
 “ thick protecting plates with which they are coated have to resist

“ the full force of the shot,” whereas in ships or batteries constructed according to this invention, “ the inclination of the sides is such that the shots striking in a horizontal, or nearly horizontal direction, glance off from them.” “ I prefer that the sides of the ship should incline outwards from the centre line of the ship until they rise up to the water line ; also, that at this point they should make a sharp angle, bend, or round, and from this point upwards that they should incline inwards towards the centre line ; the sides may, however, incline inwards towards the centre line from a point below the water line ” ; “ or they may rise above the water line while still inclining outwards, and afterwards incline inwards,” so that the angle or bend shall be above the water line.

Printed, 1s. 10d. Drawings.]

A.D. 1859, November 8.—N° 2537.

POWELL, HENRY BUCKWORTH.—“ The protection and prevention of fouling or injuring by foreign matters the screws, paddles, rudders, and stern-posts of steam-ships or other vessels.” To accomplish the object of the invention, a grating or open framework made of wood, iron, or any other suitable metal or material, is hung upon hinges or pivots, or by other means, towards or at the stern of the vessel ; and may be partly or totally immersed in the water, or entirely free therefrom ; and may be fixed on one or both sides of the screw, paddles, rudder, and stern-post of the vessel. Attached to this grating or framework is an arrangement of ropes, chains, or other similar apparatus, to draw or swing it in the position required, which may be worked from the inside or outside of the vessel, guided by wheels or pulleys fixed thereon. When it is not required to use the grating, it is drawn close against the side of the vessel in the direction of the bow or front of the vessel ; and when needed, in the direction of the stern, when it encloses the space occupied by the screw, rudder, or other machinery of the ship, serving as a guard to keep off any foreign matters in the water. A similar apparatus is applicable to paddle steamers or other vessels. Also, instead of the grating being suspended on pivots or hinges, it might be made to slide up and down by an arrangement of rods and guides, or similar apparatus fixed to the stern. Or, it might be suspended

at the stern free from the water, and allowed to swing down when required. It would thus offer no impediment to the speed of the vessel when not in use.

[Printed, 7d. Drawings.]

A.D. 1859, November 12.—N° 2571.

NORRINGTON, CHARLES.—(*Provisional protection only.*)—  
 “Improvements in the protection of ships or vessels, forts, or  
 “batteries from cannon shot, shell, or any other projectile.”  
 “The invention consists in the application of metallic wire to  
 “such purposes, either separate from or in conjunction with pro-  
 “tecting metal plating, such as heretofore employed, but it is  
 “preferred when using protecting metal plating that the same  
 “should be reduced in weight by being punctured or perforated  
 “with numerous holes, wholly or partially through, or grooved or  
 “undulated on one or both surfaces, so as to retain great strength  
 “with diminished weight. It is preferred in using wire that the  
 “same may be laid or plaited into ropes of a flattened form,  
 “though the wire may be otherwise formed into a suitable fabric  
 “to be used for the purpose, and such flat ropes or fabrics are to  
 “be affixed to the outer or inner sides of a ship or vessel, or  
 “floating or land battery,” or fort, “in like manner to protecting  
 “plates of metal.”

[Printed, 3d. No drawings.]

A.D. 1859, November 21.—N° 2635.

LENOX, GEORGE WILLIAM.—“This invention has for its object  
 “improvements in the manufacture of ships’ blocks, and is ap-  
 “plicable when manufacturing ships’ blocks of malleable cast  
 “iron. The improvements consist in forming the sides of the  
 “shells in such manner that they shall be dished or concave at  
 “their outer surfaces, and convex at their inner surfaces, by which  
 “means the opening or space between the side plates, in place of  
 “being parallel as heretofore, will incline out from each other in  
 “such manner as to produce a hopper or bell-mouth section,  
 “largest at the outer circumference of a block; and, in making  
 “sheaves of malleable cast iron, when the block is to be used at  
 “different times for a rope and for a chain, the centre portion of  
 “the sheave,” intermediate of the boss, and the grooved ring, is

“ made solid in place of hollow,” “ and thus two sheaves are  
“ rendered unnecessary.”

[Printed, 11d. Drawings.]

A.D. 1859, November 23.—N° 2654.

EASTMAN, THOMAS. — (*Provisional protection only.*) — “ Im-  
“ proved means of raising the blades of screws employed to  
“ propel ships, and apparatus for getting at such screws, and for  
“ performing other operations under water.” “ My invention, as  
“ far as concerns the raising of screws, refers to such as are  
“ formed with blades capable of being removed from the boss,  
“ and especially to those screws the subject of provisional pro-  
“ tection granted to me the 30th August 1859, N° 1973.

“ I pass a screwed shaft through the lower deck, or other  
“ suitable support, over the screw employed to propel the vessel,  
“ and work this shaft up and down, as required, by means of a  
“ nut resting on the deck or support. Instead of a screwed shaft  
“ and nut a rack and pinion may be employed. To keep the  
“ lower end of the shaft in its true position, I pass a guide in the  
“ shape of a cross-head or bar through a loop therein ; both ends  
“ of the bar are notched, and work on rails provided for the pur-  
“ pose ; the extreme end of the shaft carries a hook, and each  
“ screw blade has an aperture or ‘ eye ’ formed for the reception  
“ of the hook. The ‘ well,’ so objectionable, particularly in ships  
“ of war, is entirely dispensed with.

“ The apparatus for working under water consists of a tube  
“ closed at bottom, formed of some waterproof material, or fabric  
“ made waterproof, and fitted at intervals with hoops for keeping  
“ the tube distended ; a rope ladder is suspended or placed inside  
“ the tube, and sight holes fitted with glass or other transparent  
“ material are formed at intervals ; one or more pairs of water-  
“ proof sleeves, provided or not at their extremities with elastic  
“ gloves, are fitted in the tube.

“ To hoist the screw blades, the screwed shaft is lowered to its  
“ fullest extent ; a man enters the tube and goes down the ladder,  
“ places his arms through the sleeves and disconnects one blade  
“ from the boss, and engages the hook at the end of the shaft  
“ into the eye in the blade ; the threaded shaft is then raised,

" whereby the blade is drawn up ; another hook, that of a tackle,  
 " is hooked into the eye, the first hook is then disengaged, and  
 " the blade is hauled up by the tackle through an opening in  
 " the lower deck. The propelling screw shaft is turned to bring  
 " another blade into position for being raised, and the operations  
 " are repeated."

[Printed, 3d. No drawings.]

A.D. 1859, November 25. N° 2666.

SMITH, WILLIAM,—(*a communication from M. Eugene Lacroix, fils.*)—This invention relates to a novel mode of fitting or applying propellers, and to the mode of working or driving them, so that the full or effective power of the propelling engine may be transmitted or exerted, whatever the variation may be in the immersion or load line of the boat or other vessel ; and by which novel mode of applying the propelling apparatus, the wash of the receding waves produced by the action of the propeller, is rendered harmless to the banks of canals. " Instead of fitting the propeller  
 " or propellers (whether screw, paddle, or other form in the ordinary manner of applying and working them, I mount the propelling instrument or apparatus in a frame which is capable of  
 " being raised or lowered at pleasure by means of worm and  
 " wheels and rack gearing to an extent between the limits of the  
 " lightest and the heaviest load lines or lines of immersion." The sliding frame just described is fitted in a suitable recess or trough-like chamber, so that the water is only discharged at the end of the chamber. Thus, while the vessel only produces such waves in advance as are due to the speed at which it is propelled, the washing away of the banks produced by the action of the propeller is avoided. According to this arrangement a recess or opening is formed at the after part of the vessel, which is thus divided as it were into two hulls, or there may be two partition or division pieces, either of wood or metal fixed there, one on each side, between which the propeller would work.

[Printed, 7d. Drawings.]

A.D. 1859, November 29.—N° 2699.

BERGER, JOHN BARKER.—(*Letters Patent read for want of final specification.*)—"An improved mole of and apparatus for

“ facilitating the calculations required for navigating ships or ves-  
“ sels.” The improved mode of ascertaining the true course in  
which to sail a ship consists “in taking the proper bearings direct  
“ from a moveable compass card, or other equivalent contrivance  
“ adapted to a chart, upon which the changing position of the  
“ vessel may be marked from time to time when required to take  
“ an observation.”

[Printed, 3d. No drawings.]

A.D. 1859, December 5.—N<sup>o</sup> 2754.

HUTTON, WILLIAM.—“ Improvements in preventing the des-  
“ truction of the timbers of piers, docks, and other structures by  
“ the action of sea worms, or other marine animals.” These im-  
provements consist in the application of certain stony or metallic  
matters in solution to the timber, by smearing the external surface  
of the wood with the matters in solution, or “by immersing the  
“ wood in a bath of the same for such period of time as may be  
“ found necessary, or by forcing the same into the exterior pores  
“ of the wood by atmospheric or mechanical pressure, the wood  
“ being placed in a receiver and exhausted of all moisture and  
“ air; this latter method being preferable on account of the  
“ greater penetration thereby obtained; or if a more complete  
“ saturation and lapidification of the wood be desired, the solu-  
“ tions may be forced into the wood endwise or longitudinally by  
“ means of hydraulic, atmospheric, or mechanical pressure.”

The various applications are as follows :—“ Firstly, carbonate of  
“ lime or limestone, formed by employing a saturated solution of  
“ caustic lime in distilled water, and then submitting the timber  
“ so prepared to the action of carbonic acid gas; secondly, sul-  
“ phate of lime or gypsum, formed by the application of sulphuric  
“ acid after the solution of caustic lime, instead of the carbonic  
“ acid gas above mentioned; thirdly, a hard metallic combina-  
“ tion produced by the application of a saturated solution of iron  
“ or sulphate of iron, usually called ‘copperas,’ followed by an  
“ alkaline solution, such as carbonate of soda or potash; and,  
“ fourthly, soluble silex or water glass, produced by the solution  
“ of silex by soda or potash, and the further application of a  
“ saturated solution of chloride of calcium, commonly called  
“ muriate of lime.”

[Printed, 3d. No drawings.]

A.D. 1859, December 8.—N<sup>o</sup> 2779.

ALLEYNE, JOHN GAY NEWTON.—“ My invention consists in  
“ uniting the iron or steel plates of steam boilers and other hollow  
“ vessels formed of iron or steel plates, by welding them together,  
“ with the intervention of a double-grooved or H-shaped piece of  
“ iron or steel, which I call a ‘glut’ ” The invention, however,  
admits of certain variations, as follows:—“ The edges of the  
“ plates are introduced into the grooves of the glut, and heat is  
“ applied to the junction by means of one or more small cupola  
“ furnaces, or in any other convenient manner. When the junc-  
“ tion has reached a welding heat, the parts are compressed to-  
“ gether by hammering or rolling, or by simple pressure, and are  
“ thus united into one piece. A portion of the glut may be  
“ burned or oxidized in the operation, but the edges of the plates  
“ and the portion of the glut between them are protected from  
“ oxidation by the other parts of the glut. I bend the glut or  
“ grooved bar into cylindrical or other forms as may be required  
“ for the form of the boiler or other vessel. In some cases, as,  
“ for example, for the corners of boilers, I employ a bent or  
“ angular glut, or a piece with grooves at a right angle or other  
“ angle to each other. In some cases also the glut may be made  
“ with a rib or ribs, or with three or more grooves. I also some-  
“ times employ a glut of T-form, or a flat bar of greater width  
“ than the thickness of the plates to be united. In either of  
“ these cases it is hammered or compressed in the operation, so  
“ as to embrace the edges of the plates like the H-formed glut.  
“ I manufacture the glut by rolling it between rolls of suitable  
“ form. In some cases, however, where great precision is required,  
“ or when the form of the glut is such that it cannot be rolled,  
“ or can only be rolled with difficulty, I form the glut by any of  
“ the ordinary processes of forging or shaping metals, and, if  
“ necessary, I plane or cut out the grooves, or one or more of  
“ them, by a planing machine or other suitable tool.” “ I prefer  
“ to make the gluts of a quality of iron or steel, which is easily  
“ welded and is more fusible than the plates of iron or steel which  
“ are to be united by them.”

The invention is applicable to the manufacture of steam boilers,  
close boilers, open boilers, and pans, tanks, iron and steel boats

and ships, and generally to the manufacture of hollow vessels of plates of iron and steel.

[Printed, 10d. Drawings.]

A.D. 1859, December 8.—N° 2780.

**ARROWSMITH, JOHN.**—The invention consists of a method of constructing “land batteries and gun boats of wrought iron or “puddled steel iron.” In the construction of land batteries and gunboats, the sides are formed of rolled bars of wrought iron or puddled steel iron, or steeled wrought iron, having a groove running their whole length on one side, and a projection running their whole length on the other side; the said projection and groove being of nearly the same size. When bars of the kind described are placed upon one another, the grooved sides being all turned in the same direction, the groove on one engages with the projection of the next one; the bars being curved to the required curvature. The port holes and doors may be closed by plates of “hammered steel iron,” sliding between the walls, and supported by a lever and weight, so that by moving a catch the port-hole is closed immediately.

[Printed, 1s. 3d. Drawings.]

A.D. 1859, December 8.—N° 2781.

**ARROWSMITH, JOHN.**—“Improvements in the manufacture “of beams or girders, and in machinery and furnaces used in the “said manufacture.” The improvement in the manufacture of beams and girders, consists in making them of bars or plates of iron piled and welded together. The body of the pile is composed, by preference, of three bars in thickness, and the flanges are each made of two bars of angle iron. The several bars are secured together temporarily by rivets, and being raised to a welding heat, are welded together by rolls. The improvements in rolls consist in making rolls suitable for welding the beams or girders piled as described. The said rolls consist of two pairs. The first pair turn on horizontal axes, and have grooves and flanges proper for the reception of the partially formed girder. The girder passes through the rolls with its body in a horizontal plane, and its flanges in vertical planes. The second pair of rolls turn on vertical axes. The said second pair of rolls are plain, and as the

girder passes from the first pair, the top and bottom faces of the said girder are made true, and the girder compressed laterally By the use of an additional roll the girder may be curved when required. "I prefer to make the holes in the bars of angle iron  
 " in part by rolling, steel plugs being fixed for that purpose  
 " in the rolls used for making the angle iron. I also prefer to  
 " make the bars and angle iron with bevil edges so as to fit under  
 " one another and hold the pile together." The "improved furnace  
 " is of a length suitable to heat the partially formed girder The  
 " bottom of the said furnace is composed of grate bars nearly  
 " its whole length, and the ash-pit is closed so as to prevent access  
 " of air. Two pipes, perforated with small holes, pass under the  
 " grate bars from end to end of the furnace. The said pipes are  
 " supplied with air by means of a fan, and deliver a gentle blast  
 " into the furnace. The partially formed girder is raised to a  
 " uniform welding heat, in the furnace described, without injury  
 " to the iron. The pile may be charged into the furnace with a  
 " travelling crane, and removed from the furnace by a pair of  
 " clams attached to a pulley on the end of the rolls."

[Printed, 1s. 7d. Drawings.]

A.D. 1859, December 8. —N<sup>o</sup> 2782.

FOORD, JOHN ROSS.—This invention is for improvements in applying travellers or lifting engines to barges or other craft, for drawing piles, raising sunken craft, moorings, &c. For this purpose a travelling jenny or lifting engine is supported on bearers projecting over the end of a barge, which barge is loaded or ballasted at the other end to such an extent, that when the required strain is brought on the engine, the two ends of the barge shall be nearly equally immersed. In the arrangement of lifting engine shown, the engine can travel to and from the midships of the barge or vessel, and be brought and retained in such a position when in use, as to bring the tackle directly over the object to be raised.

[Printed, 1s. 2d. Drawings.]

A.D. 1859, December 12.—N<sup>o</sup> 2816.

STATHER, THOMAS.—*Provisional protection only.*)—"This invention relates to a peculiar mode of ventilating public buildings

“ or dwelling houses, ships, or other enclosed places, and consists  
 “ in fitting a box, open at both ends, and of any desired contour,  
 “ in the upper part of the side or in the ceiling of the building,  
 “ ship, or place to be ventilated, such box being made to commu-  
 “ nicate either with the external atmosphere or with the chimney  
 “ flue, and should be so disposed that one of its mouths in  
 “ all cases will be inwards or towards the apartment and the other  
 “ towards the external atmosphere or chimney flue. The mouth  
 “ towards the external atmosphere or chimney breast is contracted  
 “ or partially closed. The inward mouth is also partially closed,  
 “ either by a central plate or by a portion of the box, whilst the  
 “ remaining uncovered portion of the larger or inward mouth is  
 “ closed in by finely perforated plates or wire gauze. The result  
 “ is that should the smoke from the chimney flue or the air from  
 “ the outside enter the box it will first strike the plate or portion  
 “ of the box above referred to, and will expand in the box,  
 “ in which expanded state it will be overcome by the out-rushing  
 “ rarified air of the apartment, and consequently the inlet of  
 “ smoke or cold air is prevented, whilst the carbonic acid gas  
 “ passes freely off and leaves the room pure and healthy.”

[Printed, 3d. No drawings.]

A.D. 1859, December 14.—N° 2842.

LESLIE, ANDREW.—This invention relates to the construction  
 of iron ships or vessels, and to the strengthening of the same at  
 those parts where the strain is most felt, by means of wrought  
 iron, steel, or other metal box girder stringers or tubes, such box  
 girder stringers being placed on the beams of the several decks,  
 at the sides of the vessel; or under the beams, at or near the centre  
 line of the vessel, or at the sides of the hatchways. The whole or  
 any of these stringers may be continued throughout the entire  
 length of the vessel, or may extend along any part thereof as may  
 be desired.

[Printed, 8d. Drawings.]

A.D. 1859, December 17.—N° 2878.

HINSCH, JOACHIM DAVID.—This invention consists in so  
 constructing gunboats, as that the floating or buoyant part thereof  
 shall be capable of being submerged in water, so as to either  
 partially or entirely conceal it; and also in forming the battery

thereof, or that part in which guns are fixed or mounted, so that it shall resist the force of heavy shot or balls. For these purposes, "I employ two long hollow cylinders of metal, each formed " conical at one end, which constitutes the head of the boat or " twin boat;" the other and opposite end of one or both of such cylinders, constituting the stern, is fitted with a screw propeller, actuated by suitable machinery inside one or both of the cylinders; or one cylinder may be appropriated for carrying the mechanism, or engine, boiler, and fuel necessary for working the propelling screw, and the other cylinder may be appropriated for ammunition, and also for the hands or crew of the boat. Midway of the length of these cylinders, two double wedge-shaped metal tubes are firmly built, one to the crown of each cylinder, such tubes inclining inwards towards each other at top, so as to maintain the cylinders at some feet asunder, according to the size of the boat. The tubes extend some few feet above the top or crown of the cylinders, and upon the top of the tubes an open double wedge-shaped chamber or battery of metal is fixed. The sides of this chamber it is proposed to form of very thick plates of metal, or metal in combination with any elastic or yielding substance or material, capable of destroying or lessening the effect of shot or balls. Through the wedge-shaped ends of the chamber or battery two guns are passed, one pointing to the head and the other to the stern of the boat. Access may be had to the battery from either of the floating cylinders through the tubes, the tubes serving also for ventilation, and the passage of atmospheric air into the cylinders, so that when the cylinders are entirely submerged, the battery only is above the surface of the water.

[Printed, 8d. Drawings.]

A.D. 1859, December 30.—N° 2986.

JONES, REIBEN, and STOTHARD, DANIEL.—(*Provisional protection only.*)—Improved mechanical arrangements for raising, lowering, and disengaging ships' boats and other heavy bodies. These consist, first, of an improved construction of block for raising and lowering heavy bodies; and, secondly, of improved mechanism, either separate from, or used in combination with, the aforesaid blocks, for raising, lowering, and disengaging ships' boats from the tackles which suspend them. The construction of the block is as follows:—"It consists of three pulleys, or one sheave

“ and two small pulleys, two of which revolve on fixed axes, and the  
“ other and intermediate pulley has its axis fixed in the pulley, and  
“ said axis fits into curved slots formed in the side plates of the  
“ block, so as to be capable of moving up and down the same. By  
“ thus constructing blocks, the necessity for employing blocks with  
“ two or more sheaves, as commonly practised, is dispensed with,”  
and less rope is required in consequence of its only having to pass  
over the aforesaid sheave and between the two pulleys, the effect  
being as follows:—In proportion to the amount of weight attached  
to one end of the rope, in like proportion will be the pressure  
upon the moveable pulley, thereby squeezing or wedging the rope  
between the two pulleys, and thus producing the same effect as  
would be produced by passing a rope round a cleat in lowering  
weights. In connexion with the aforesaid block or blocks, at the  
head of the “davits,” “we employ the following mechanism for  
“ raising, lowering, and disengaging ships’ boats, that is to say,  
“ underneath the middle ‘thwart’ of the boat we affix two  
“ uprights, across which we pass pins, on which are hooks and  
“ catch levers, the outer ends whereof pass in opposite directions.  
“ The ends of said catch levers are connected together by a rope or  
“ chain, which passes loosely over the top of the ‘thwart.’  
“ A single rope passes from each of the aforesaid blocks over  
“ a broad pulley fixed at the stem and stern of the boat, and to  
“ the end of each rope a link of iron is fastened, so that when  
“ such links are each passed over their respective hooks aforesaid,  
“ and the boat raised from above, the boat cannot by any means  
“ become disengaged from the ‘davits’ until she touches the  
“ water, when, by pulling the rope which is across the middle  
“ ‘thwart,’ ” the hooks will be disengaged, and the ropes will pass  
under the pulleys at the head and stern of the boat, and by  
these means the boat will be disengaged stem and stern at the  
same time.”

[Printed, 3d. No drawings.]

1860.

A.D. 1860, January 2.—N° 3.

**SIMONS, WILLIAM.**—Improvements in the construction of ships or vessels for mercantile and for war purposes, for the sake of obtaining increased strength and protection. The first improvement relates to the decks, and consists “in combining  
“ diagonal deck planking with a diagonal arrangement of the  
“ beams, whether these are of timber or metal, the planking and  
“ beams being disposed in reverse diagonal directions. It is preferred to combine this system of deck planking with the system  
“ of arranging deck beams described in the Specification of Letters  
“ Patent granted to me, bearing date the 9th July 1858, N° 1545.  
“ The deck planks are fastened to the beams, and may also be  
“ fastened laterally to each other.”

The second improvement relates to the plating of metal ships, and is also applicable in the construction of their masts. It consists, according to one modification, in forming the plating of two thicknesses or layers of plates, arranged in reverse diagonal directions. “With this improved construction of the shell of the  
“ vessel, I consider neither keels nor vertical frames to be requisite as far as strength is concerned, and for these I substitute  
“ internal longitudinal stringers, clamps, and kelsons, which can  
“ be advantageously fitted and secured directly upon and in close  
“ contact with the shell without the obstruction of vertical frames,  
“ and may be through-riveted to the shell at short distances.” According to another modification, a single thickness or layer of diagonally-disposed plates may be combined with frames arranged in the reverse diagonal direction. Or the duplex diagonal formation of the hull may be obtained by applying internally upon the ordinary vertical, or upon diagonal frames, a series of plates, clamps, stringers, or planks fixed in the reverse diagonal directions, and constituting the ceiling. This ceiling may be either of metal or wood, and close seamed or more or less open. “In some cases  
“ vessels constructed with my improved duplex diagonal plating  
“ may be fitted with a ceiling of wood, arranged vertically either  
“ along with or without the ordinary angle-iron framing.” In a similar way an external sheathing of wood disposed vertically may

be applied to the diagonal plating, and this wood sheathing may be coppered below the water line.

In applying the diagonal system of plating to the construction of iron masts, a single layer of plates may be used, these being close seamed and rivetted together; or there may be two sets of narrow plates or bars crossing each other diagonally, spaces being left between them. "In both arrangements internal diagonal transverse or solid stretchers or supports may be added to give increased strength."

The third improvement relates to wood-planked ships, and consists in inserting strips or plates of metal between the edges of the planks of the side, or of the decks. These metal strips or plates may be continuous, or may consist of short pieces covering the butt joints. The plates are placed above and below the butt joint, and bolts are passed through them, and through the adjacent planks. In vessels for war purposes or otherwise, requiring great strength, the plates are to be inserted continuously between the edges of the planks. In some cases, to afford protection to the planking against shot, the outside edges of these plates may be made angular and projecting, and the back of the plate may be formed with vertical bearing flanges.

The fourth improvement "relates to the metal casing of ships or floating batteries or forts intended for war purposes, and consists in forming it so as to present externally a series of angular grooves and ridges. The inside surface of this casing may be flush, or it may be grooved, and the grooves may or may not be filled up with wood or other material. The grooves may be either horizontal, vertical, or inclined."

The fifth improvement relates to ships or other vessels intended for war purposes, and consists "in placing an inclined shield along and within the sides of the vessel, in order to deflect shot passing through the vessel's side. This shield may be inclined upwards or downwards, or both ways, from the vessel's side, and it may be pierced for guns."

[Printed 1s. 4d. Drawings.]

A.D. 1860, January 6.—N° 46.

HARLAND, EDWARD JAMES.—"Improvements in constructing and covering the decks of ships and other floating bodies."

The invention consists "in the construction of the decks of

\* ships or other floating bodies of iron plates, either corrugated  
 \* or formed with projections on or cavities in the surface of the  
 \* same of any desirable pattern, which projections I make higher  
 \* and cavities deeper than in the plates which have hitherto been  
 \* in use for foot plates in engine rooms and such like purposes.  
 \* I also fill the cavities in the aforesaid plates and spaces between  
 \* the projections in the same with Portland cement, Roman  
 \* cement, or other cement, sand, and sulphur, asphalt, marine  
 \* cement, or any other suitable material or combination of  
 \* materials. I also cover decks formed of iron plates, either  
 \* plain, corrugated, or made with projections and cavities as  
 \* above described, or decks of any other material, with a suitable  
 \* layer of stone, stoneware, earthenware, gravel, tiles, bricks, or  
 \* any modification of the foregoing metal borings, wood paving  
 \* blocks, or any other material that can be adapted to the pur-  
 \* pose; which material I propose to unite and hold together, and  
 \* to the iron decks beneath, by means of some one of the fol-  
 \* lowing materials, or two or more of them combined, as may be  
 \* found most suitable, such as asphalt, vegetable or mineral  
 \* pitch, rosin, or other bituminous substance, pigments, sulphur,  
 \* and sand, Roman, Portland, or other cement, or any substance  
 \* capable of uniting or binding the aforesaid stone, stoneware, or  
 \* other materials to each other, and to the said iron decks."

[Printed, 3d. No drawings.]

A.D. 1860, January 16.—N° 111.

RENDEL, ALEXANDER MEADOWS.—"Improvements in the  
 \* construction and arrangement of ships of war." "I employ  
 \* armour in the form of iron or steel plates, or plates of other  
 \* material, or armour in any other form backed with timber or  
 \* not, or otherwise protected in-board of the ship, upon longi-  
 \* tudinal and transverse bulkheads or girders extending upwards  
 \* from the ship's bottom, or other convenient place to the height  
 \* requisite for the shelter of the gun deck, with or without  
 \* plating of any thickness, laid upon timber or otherwise pro-  
 \* tected and strengthened overhead. The armour necessary for  
 \* the protection of the ship may be placed wholly on the girders,  
 \* or only so much as is necessary for the protection of the gun  
 \* deck and deck below; it may be placed on the girders, the

“ remainder being placed on the ship's sides, or otherwise connected together.

“ In arranging ships of war, whether the armour, as above described, be applied, either in whole or in part, I proceed as follows :—

“ First, I place the weight of the armour as near the centre of gravity of the ship as possible, with a view to diminish the oscillations it would occasion.

“ Secondly, for the same purpose, and also in order to increase the steadiness of the platform from which they are fired; I place the guns as near the centre of the ship as possible.

“ Thirdly, in furtherance of these objects, and to assist in working the ship, I construct it with a gangway all round the battery between the ship's sides and the space enclosed for the battery.

“ Lastly, I arrange and construct the ship in such manner as to incorporate some of the material necessary for the protection of the battery into the strength of the ship, save the ship's sides from the straining which would result from the armour being laid upon them, and in combination with wrought-iron upper and lower decks divide the ship into a great number of water-tight compartments.”

[Printed, 8d. No drawings.]

A.D. 1860, January 19.—N° 140.

**BOWER, ANTHONY.**—“ This invention has for its object improvements in ship-building.” “ For these purposes the lower part of the body of a ship or vessel which is below the water line is built in the same manner as if it were to be a metal ship or vessel, whilst the upper part from somewhat below the water line is built as a timber ship or vessel. In thus constructing a ship or vessel, particularly for war purposes, the lower parts of the ribs or main framing of the ship or vessel are formed of metal, such as wrought iron,” the kelsons being by preference box kelsons made of sheet iron or steel; and it is preferred that all the beams should also be of metal, and plated over on the top of the beam with sheet metal, and then planked over with wood.

The lower ends of the main timbers, or upper framing of wood, are arranged to descend below the water line, and to pass between

the upper ends of the iron or other metal ribs; and the outside iron or other metal plating of the ship or vessel may be carried up more or less above the water line, and be planked over with wood planking, and such wood planking may be carried down to any desired depth below the water line. The ceiling of the interior of the body of the ship or vessel is preferred to be of wood; it is also preferred to plate over the interior of the body with metal plates before the inner wood planking is applied.

[Printed, &c. Drawings.]

A.D. 1860, January 26.—N<sup>o</sup> 202.

PLUM, THOMAS WILLIAM.—“Improvements in preparing and  
“fixing iron and other metal plates to ships and other struc-  
“tures.” “For shielding ships and batteries on land or floating  
“with thick metal armour plates, I use metal ribs with a flange  
“or flanges, through which they are to be bolted to the ship,  
“battery, or other structure, and a dovetailed or T-head rib for  
“holding the plates. The flange and dovetailed ribs” may be of  
any suitable form, “so that there be a flange or flanges for bolting  
“through, and a transverse head having more or less of dovetail  
“shape, in order that when the plates which are to be prepared to  
“fit the ribs are inserted between two of such ribs, they will be  
“securely held in their intended position, that the plates when  
“fixed shall cover the bolt holes, and that the joints or points of  
“junction between the plates and ribs shall have a tendency to  
“tighten when struck on or near the joints. In preparing the  
“ribs, except the first, to be fixed to any structure, the bolt holes  
“in one side of the flanges of the ribs are to be made longer,  
“i.e., oval in form in the transverse direction of the rib, so as to  
“admit of the second and successively fixed ribs being in the  
“first place bolted through the elongated bolt holes far enough  
“from the rib previously fixed to allow the plates to be inserted  
“between them without difficulty, and the rib to be then drawn  
“by cramps or other known means tightly to the plate, the row  
“of bolts on the other side of the rib are then put in and made  
“fast. The upper and lower, and vertical end ribs are made with  
“one side only prepared to receive or hold plates, the other being  
“rounded, moulded, or bevelled off in any suitable shape.” The  
space between the back of the plates, and the face of the ship or

other structure, may be more or less according to the dimensions determined for the ribs and plates, and may be filled with any material that may be found most suitable.

[Printed, 5*d*. Drawings.]

A.D. 1860, February 29.—N<sup>o</sup> 552.

LYNCH, PATRICK FRANCIS, and TYNAN, JOHN.—(*Provisional protection only.*)—"Improvements in the construction of boats, and in the use or application of certain novel arrangements and apparatus thereto."

"The peculiar arrangements of the parts of our said boat admit of great facility in taking to pieces, of being easily stowed or packed in small space, and expeditiously fitted up when required, thus allowing a vessel to carry many life boats, enabling the means of transporting a large army across rivers to be conveyed overland in one waggon, the boats being at the same time applicable for any of the uses of ordinary boats, and parts of the same can be applied to boats generally.

"The keel is made of suitable material, say, galvanized iron either in one piece or hinged, and has affixed by joints or other suitable arrangement the stem and stern posts, all of which can be folded up so as to occupy small space. The stem and stern posts have apertures therein or affixed thereto, through which are passed the lowering tackle hooks, and are made sufficiently heavy or have weights attached to keep her taught when lowered into the water or striking against a rock or ship's side. The ribs, frames, or stanchions are made with jointed pieces of metal plates betwixt them on the principle of the 'lazytongs,' to admit of being folded closely together, but which serve to keep them at proper distances when distended. The lower ends of the frames are shaped to clip the keel, and may be secured by pins. Plates of perforated metal are affixed to the stem and stern and to the ribs for a few feet from each end to give strength. The gunwale made hollow has rowlocks fastened therein, and is shaped to fit on the top of the frames, to which it is fastened with spring bolts or other contrivance, the ends being securely attached to the stem and stern posts. The floor folds up like carriage steps, and is made to fit the particular shape of the boat. The thafts are made to fit and fasten to the

“ ribs, and tend to strengthen and keep the boat elastic, or give  
 “ ‘working.’ Instead of the ordinary planking with wood or  
 “ plating with metal, we use a covering of gutta percha, india-  
 “ rubber, or other flexible or elastic material, fabric, or substance,  
 “ over the parts described, when fitted together; that part of the  
 “ ‘planking’ or covering near the gunwale being double and  
 “ containing air, will serve to keep the boat afloat should any  
 “ part get damaged.” “ Over the entire boat is raised a covering  
 “ of flexible material supported by stanchions, and buttoned or  
 “ otherwise fastened to or near the gunwale; rain falling on this  
 “ covering is made to flow into the hollow gunwale by openings  
 “ for that purpose, and when these are full into a cistern or tank  
 “ in the bow or stern, the space in the bow or stern not used for  
 “ water having a locker for containing provisions.”

A model boat is also described, intended to be sent adrift from a vessel in distress or in danger of being wrecked, and in which would be placed any written document deemed necessary to guide a vessel to the one in danger. The self-steering apparatus for this model boat, consists of a rod having affixed at the top an umbrella-shaped apparatus, on which the wind acts, the other end of the rod fits into or upon an octagon-shaped rudder head. This apparatus set with the position of the sail, will allow the model boat or messenger to be directed as desired. The model boat or messenger can also be used as a buoy, and for the saving of life at sea.

[Printed, 3d. No drawings.]

A.D. 1860, March 3.—N<sup>o</sup> 593.

MUNTZ, WILLIAM HENRY.—The improvements relate “ to the  
 “ construction of ferry boats with ‘flush’ decks, and the object  
 “ of the invention is to enable such boats to carry horses, cattle,  
 “ carriages and passengers, without risk of danger.

“ The improved ferry boats are constructed as follows:—The  
 “ boats are built with ‘flush’ decks, level with and sup-  
 “ ported on the gunwales, the said decks overhanging the sides  
 “ of the vessel to the width of the outside of the paddle wheels,  
 “ or even further if necessary. The cabins for the passengers  
 “ are built on this overhanging part, and the track for carriages  
 “ and horses runs between these cabins and the engine house,  
 “ which latter is in the centre of the vessel. On this part of the

“ deck, fore and aft of the engine house, are the sheep and cattle  
“ pens, to prevent the animals from interfering with the carriages  
“ and horses. These pens have folding doors, and the horse  
“ deck may also have similar doors, so as to form as it were a  
“ stable when closed. There is a promenade deck over the  
“ cabins, which may, if desired, also be carried over the carriage  
“ and cattle deck. The vessel is steered by two helms (one at  
“ each end), which may either be worked separately or be both  
“ actuated by one wheel. The communication with the shore is  
“ made by means of a floating ‘dummy,’ the deck whereof  
“ is about the same level as the flush deck of the ferry boat, so  
“ that horses, carriages, and cattle can be driven on or off the  
“ latter with great facility. The ‘dummy’ is attached to the pier  
“ or landing, and rises and falls with the tide.”

[Printed, 8d. Drawings.]

A.D. 1860, March 10.—N° 651.

RAE, JAMES.—“ Improvements in constructing iron ships, part  
“ of which improvements is applicable to the rivetting of boiler  
“ plates and others.” The invention relates, firstly, to the method  
of fixing and securing the bulkheads, and to the strengthening  
of the ship where the bulkheads are fixed. “ Instead of con-  
“ necting the bulkhead plates to one angle iron on one side, or  
“ with two angle irons, one on each side, and punching a row  
“ of rivet holes in a straight line round the ship, whereby the  
“ vessel is weakened, I employ one broad flanged T-iron of any  
“ width necessary according to circumstances; the arms of the  
“ T extend an equal distance on each side of the bulkhead, and  
“ are sufficiently broad to allow of the rivets being placed a con-  
“ siderable distance apart in a zig-zag position. I roll the flange  
“ or body part of the T which stands athwart-ships, say, three  
“ times the usual thickness, and cut a groove in the centre suf-  
“ ficiently wide to receive the bulkhead plate; the sides of the  
“ groove form two flanges to rivet the bulkhead plate to instead  
“ of one, whereby strength and stability are secured. The bulk-  
“ head is of one uniform thickness from bottom to top; the  
“ plates, instead of lapping each other are made to butt hori-  
“ zontally as well as vertically, and form a flush surface; they  
“ are connected with butt straps on one side and stiffening bars

“ on the other. For bulkheads which are required to diminish  
 “ gradually from bottom to top, I roll the T-iron flanges all one  
 “ thickness, and make the bulkheads either with butt or lap  
 “ joints. To strengthen ship's sides opposite the bulkheads,  
 “ instead of using the usual kind of strip commonly called  
 “ ‘liners,’ which are intended to fill up the space between the  
 “ plates, I use a plate the whole width of the space, which ex-  
 “ tends along the ship's sides as far as the second or third frame  
 “ on each side of the bulkhead, and in like manner on the out-  
 “ side of the ship, with the exception that the outside plates are  
 “ drawn down in a tapering form to a thin edge, thereby offering  
 “ as little obstruction as possible in passing through the water.  
 “ These strengthening plates are continued all round the ship's  
 “ body from gunwale to gunwale. The bulkheads are rivetted  
 “ through the inside stringers and skin of the vessel, then the  
 “ outside strengthening plates, and are properly rivetted to the  
 “ skin of the ship, forming a double thickness of plates all round  
 “ the ship opposite the bulkheads, thus making the ship stronger  
 “ at the bulkheads than at any other part.”

Secondly, “to a method of rivetting the plates together in  
 “ constructing iron ships, which method is also applicable to the  
 “ rivetting of boiler plates and others. It consists in forming  
 “ two countersinks, one in each plate; I prefer that the counter-  
 “ sinks should not extend entirely, but only partially through the  
 “ plates, say, to the extent of about two-thirds of their thickness.  
 “ I form the rivets with a head on one end to fit the counter-  
 “ sink; and for some purposes I form the end or top of the head  
 “ slightly curved, the other end of the rivet is formed as a simple  
 “ bolt, and after the plates have been brought together and the  
 “ rivet inserted, bolt end first, the head is supported by the dolly  
 “ or other tool while the bolt end is hammered out and made to  
 “ fit in the countersink formed for its reception in the plate. For  
 “ ships the curved end of the rivet would be on the inside, while  
 “ on the outside the head would be hammered into the counter-  
 “ sink flush with the surface of the plate.”

[Printed, 10d. Drawings.]

A.D. 1860, March 22.—N<sup>o</sup> 746.

RENNIE, GEORGE BANKS.—“This invention relates to a novel  
 “ mode of constructing floating platforms, pontoons, or docks.

“ for supporting ships or other vessels, and in the mode or method  
“ of arranging the parts of the same, and in the mode or method  
“ of working or employing apparatus so constructed.”

“ It consists in constructing an iron water-tight hollow platform  
“ of a rectangular or other convenient form, of a depth and capa-  
“ city suited to the purpose for which it is intended, and in the  
“ division of such hollow platform by longitudinal and transverse  
“ bulkheads into any convenient number of parts or chambers.  
“ On the upper part and towards each side of such hollow plat-  
“ form, a hollow iron water-tight longitudinal chamber is carried  
“ from end to end, of a convenient form, having an internal  
“ capacity sufficiently great, so that the upper part being divided  
“ from the lower part by means of an air-tight horizontal division  
“ or floor,” “ sufficient floatative, balancing, and supporting power  
“ is obtained to enable the greatest degree of immersion of the  
“ whole structure or apparatus to be safely effected. The lower  
“ part of each hollow wall or longitudinal chamber is fitted with  
“ valves for the admission and exit of water, and the water con-  
“ tained therein may be allowed to flow out or in as the structure  
“ is raised or lowered. The hollow walls or longitudinal cham-  
“ bers as well as the basement or hollow platform or pontoon  
“ are divided into chambers by means of transverse water-tight  
“ bulkheads, so that by means of valves the water may be let out  
“ or admitted at pleasure in one or several of the chambers, thus  
“ enabling the base of the dock to be kept in a horizontal or  
“ level position. Suitable barks of timber are laid along the”  
“ floor of the hollow platform or pontoon upon which the keel of  
“ the vessel is intended to be received, and these are supported  
“ by longitudinal and transverse girders, thus distributing the  
“ weight so as not to alter the form of the hollow platform or  
“ pontoon ; the side walls are also strengthened by girder frames.

“ On the top of the side walls or hollow chambers steam power  
“ may be placed for the purpose of discharging the water from  
“ the basement portions of the apparatus for the purpose of per-  
“ forming other work or operations in connection with the dock,  
“ such as raising, lowering, hauling, or removing materials, and  
“ other similar operations, and also for working air-exhausting  
“ and air-compressing pumps, as well as those for the raising and  
“ discharging of water. The pipes connected with the various  
“ pumps are carried along in any convenient manner to the

“ various chambers, sections, or divisions of the dock, and in  
“ turn the different chambers are connected by means of pipes  
“ and sluices or other valves which are capable of being acted  
“ upon independently.

“ In such floating platform, pontoon, or dock, fixed or moveable  
“ ends or gates or caissons for the purpose of enclosing the vessel  
“ can be dispensed with, and are not needed, and the water in  
“ which the vessel has floated, and which water would, in case of  
“ using gates, &c, have to be pumped out or otherwise discharged,  
“ will leave the vessel during the time the dock and vessel are  
“ being raised, but the floatative power of the bottom or base-  
“ ment, when the water is forced or drawn out by pumps or  
“ forced out by means of compressed air or otherwise discharged  
“ therefrom is made sufficiently ample to support the weight of  
“ the structure and also of the largest and heaviest vessel which  
“ can be drawn within it or otherwise placed on it. The sluice  
“ cocks are so arranged that they may be worked from the deck  
“ formed on the top of each hollow side wall, and by this means  
“ either one or any greater number of chambers may be filled or  
“ discharged at pleasure, and thus any irregularity in the dispo-  
“ sition of the load, or any inequality in the stowage of the  
“ weights of the ship which is being docked, may be compensated  
“ for.

“ In addition to the longitudinal and transverse plate-iron  
“ bulkheads, the pontoon as well as the side walls are strength-  
“ ened by means of open or lattice girder frames formed of  
“ diagonal iron braces and trusses, and similar iron trussings are  
“ applied in a longitudinal direction, and diagonal iron frames are  
“ introduced between each system of girder frames to strengthen  
“ the iron plating.

“ On the exterior surface of each wall wooden fender planks or  
“ timbers should be fixed and suitably deep angle irons should  
“ be securely rivetted along the side plates for the purpose of  
“ affording the means of readily fixing such wooden fender planks  
“ or timbers.”

[Printed, 16d. Drawings.]

A.D. 1860, March 29.—N° 817.

HAMILTON, JOHN, jun.—This invention has for its object im-  
provements in constructing and propelling vessels. “ For these

“ purposes in order to use paddle wheels at the ends of vessels  
 “ more advantageously than heretofore, each vessel is constructed  
 “ double at the end where the paddle wheel is to come, and the  
 “ two parts are at such a distance apart as to admit of a paddle  
 “ wheel between them, the bearings for the shaft of the paddle  
 “ wheel being carried by the two parts of which the vessel is  
 “ constructed. The upper parts of these two structures are  
 “ decked over, and a paddle box rises from such deck and passes  
 “ over the paddle wheel, leaving a space on the deck to admit of  
 “ passing on either side, and the deck extends beyond the paddle  
 “ wheel, so that there is a free passage all round. The rudder is  
 “ placed beyond the paddle wheel, and its axis is supported in a  
 “ suitable bearing or bearings on deck, no stern post being used.  
 “ The body of the vessel where it joins the two parts of the  
 “ body which come at the two ends of the paddle wheels” is  
 “ curved or inclined so as to make a suitable form for the recep-  
 “ tion of the paddle wheel.”

[Printed, 8d. Drawings. See No. 1837 (1860).]

A.D. 1860, May 23.—N° 1282.

BOUSSOIS, FRANÇOIS JOSEPH EDOUARD DUCLOS DE.—(*Provisional protection only.*)—“ This invention relates to an improved  
 “ system or mode of manufacturing tubular metal articles, such,  
 “ for example, as hollow axles, shafts, gun barrels, and masts,  
 “ and consists essentially in the substitution of cast steel for  
 “ wrought iron in such manufacture. In making a hollow axle  
 “ or tube according to this invention, it is proposed to prepare a  
 “ block of cast steel of an annular form, the weight and dimen-  
 “ sions of which are proportioned to the weight and dimensions  
 “ of the hollow cast-steel axle or other article to be produced.  
 “ This cast-steel ring having been heated to a welding heat, is  
 “ placed on a mandril, and rolled thereon between a pair of rolls  
 “ according to the manner described in the Specifications of  
 “ Mr. James Edward McConnell’s Letters Patent, of the 28th  
 “ August, 1851, N° 13,729, and the 24th June, 1852, N° 14,182.”

[Printed, 3d. No drawings.]

A.D. 1860, May 25.—N° 1297.

FINCH, BENJAMIN.—(*Provisional protection only.*)—“ This in-  
 “ vention has for its object an improvement in the arrangement

“ of the rudders of ships and vessels; heretofore steam vessels  
 “ built to run either end foremost have frequently been fitted  
 “ with two rudders, one or other of which is employed according  
 “ as one or other end of the vessel is leading, the other rudder  
 “ being for the time locked. Now, according to this invention I  
 “ fit ships and vessels with two rudders, one at each end, and  
 “ I connect the two together in such a manner that they neces-  
 “ sarily move both at the same time and towards the same side of  
 “ the ship or vessel. By this arrangement the two rudders both  
 “ tend to turn the ship in the same direction, and the pressure of  
 “ the water on the one is balanced by that on the other, and con-  
 “ sequently but little power is required to steer the ship or  
 “ vessel.”

[Printed, 3d. No drawings.]

A.D. 1860, May 29.—N<sup>o</sup> 1325.

SAMUELSON, ALEXANDER.—*Provisional protection only* :—  
 “ This invention has for its object improvements in gun boats.  
 “ For these purposes when constructing a gun boat provision is  
 “ made for taking in and discharging water in such manner that  
 “ a gun boat may be immersed very deeply when going into  
 “ action, the object being to render a gun boat less visible to an  
 “ enemy at a distance.” “ In constructing a gun boat or vessel  
 “ in order to obtain these results it is preferred,” where the body  
 “ is of iron, to construct such body double, “with water space or  
 “ spaces between,” “ or in place thereof water chambers or  
 “ tanks may be constructed or arranged internally of the vessel  
 “ with provision for running in and removing water from them.”

[Printed, 3d. No drawings.]

A.D. 1860, June 9.—N<sup>o</sup> 1420.

WESTWOOD, JOSEPH — “ Improvements in armour plates for  
 “ iron ships and vessels, or forts, or batteries.” This invention  
 “ has for its object “the formation of the plate with a surface  
 “ adapted to cause the deflection of a shot or other projectile  
 “ striking the same, and thereby to prevent the metal from being  
 “ penetrated in the manner to which ordinary armour plates are  
 “ liable to become penetrated, and also the application thereof  
 “ to iron ships and vessels, forts, or batteries. For this purpose

“ the surface of the plate is corrugated, indented, grooved, or  
“ channelled to a depth of not less than two inches, or there-  
“ abouts, so as to be of sufficient depth to cause a shot or other  
“ projectile when striking it to ‘plant off’ in the direction given  
“ to its course by the form of the corrugation, indentation,  
“ groove, or channel against which it strikes. The form of the  
“ corrugations, indentations, grooves, or channels may be varied ;  
“ but I prefer those forms which have the tendency to deflect in  
“ the greatest degree the course of a shot or projectile striking  
“ the surface of the plate point blank. In applying the armour  
“ plate to ships and vessels it is intended to cover it with plates  
“ of iron of a plain surface, and between such armour plates and  
“ plates of a plain surface I may or may not introduce a packing  
“ or filling of wood or other suitable material.”

[Printed, 3*d*. No drawings.]

A.D. 1860, June 12.—N° 1443.

CATLIN, GEORGE.—“ The object of this invention is to con-  
“ struct vessels with unsinkable hulls, by which the lives of  
“ passengers may be protected as on a raft in cases of ship-  
“ wreck. These hulls or rafts it is proposed to build some-  
“ what in the form of ordinary steamers, with seasoned pine or  
“ other squared timbers, and entirely solid up to or above the  
“ water line, with the exception of such part or parts of the said  
“ hulls as may be necessarily required for the free and advan-  
“ tageous action of the engines and other machinery, and their  
“ communications with the propeller acting on the water. The  
“ floating and lifting powers of the hulls or rafts will be due to  
“ the buoyancy of the timbers, instead of as in ordinary steamers  
“ from the buoyancy of a hold, but assisted by the formation  
“ therein of a central longitudinal bore of greater or less diameter  
“ extending through a portion or the whole length of the hull or  
“ raft, the end or ends of the bore being blocked up and herme-  
“ tically sealed. The timbers used to form the bottom and deck  
“ of the hull are to be laid longitudinally in the direction of the  
“ length of the vessel, and bound with planks which cross them  
“ at right angles. The hull is built up with transverse hori-  
“ zontal compact layers of timbers, bored or unbored, as may be  
“ expedient, crossing each other diagonally, and secured together

" with iron and wooden bolts obliquely driven, and laid in heated  
 " tar or pitch or cement. This solid mass of timbers perfectly  
 " shaped into the intended form of the hull of a vessel, but as  
 " yet without siding ribs or casing of any kind is, after effecting  
 " caulking, to be paid over with several coats of boiling tar or  
 " pitch, in order to hermetically seal the pores of the timber  
 " ends and the joints between them; and on this a covering of  
 " coarse felt saturated with heated tar is to be applied, and over  
 " all a double planking. The first a vertical layer (also laid in  
 " heated tar or pitch) of planks (or ribs, extending above the  
 " deck of the hull, of sufficient strength and thickness to form a  
 " part (and strengthen the sides, of the superstructure and the  
 " bulwarks. And the second, a longitudinal layer of less thick-  
 " ness, and covered (if advisable) with sheathing iron, thus  
 " rendering it entirely impervious to water and to fire."

[Printed, *6d.* Drawings.]

A.D. 1860, June 15.—N<sup>o</sup> 1462.

COLES, COWPER PHIPPS.—This invention consists "in forming  
 " iron-cased ships of war with two sides or a double side at the  
 " part of the ship which is protected by the iron casing the inner  
 " side being inclined inwards at a considerable angle and cased  
 " with thick metal, and the outer side being for the purpose of  
 " completing the external form of the vessel, according to an  
 " improved design, and for affording the requisite deck and other  
 " accommodation between it and the upper portion of the  
 " defended side. The outer side is to be of iron, and should be  
 " constructed as lightly as is consistent with the required strength.  
 " In some cases it may be desirable to modify the arrangement  
 " just described, by placing two or more inclined sides within the  
 " thin external side for the purpose of presenting a series of  
 " inclined obstacles to the progress of shot, and thus gradually  
 " diverting it from its original path and causing it finally to pass  
 " off from or out of the ship without entering the inner inclined  
 " side.

" Ships having their sides formed in the manner described will  
 " be particularly well adapted to receive cannon covered with  
 " protective shields according to a former Patent granted to me  
 " on the 30th day of March 1859, N<sup>o</sup> 798."

[Printed, *6d.* Drawings.]

A.D. 1860, July 10.—N° 1656.

JORDESON, THOMAS POWDITCH.—“Improvements in life  
“boats.” This invention consists “in constructing the boat or  
“vessel so as to be tubular or closed at the top as well as at the  
“bottom and sides, and combining therewith moveable T-shaped  
“keels, which are inserted through spaces formed to receive  
“them. The form of the boat or vessel may be varied, but the  
“cross section of it would resemble a flattened tube from the  
“bottom of which the keels project. These keels consist of a  
“vertical plate or plates with two wings at the lower end, and  
“they may, if preferred, be constructed so that the wings may  
“have a tendency to open or spread apart by the upward pressure  
“of the water. Four of such keels are intended to be applied to  
“each boat or vessel, viz., one at each end, and one at each side,  
“but the number may be varied. These keels are also capable of  
“being raised so as to bring the wings in contact with the bottom  
“of the vessel when required. Around the vessel is formed a  
“hollow belt of india-rubber vulcanised or otherwise, gutta  
“percha, canvas, or other suitable material, such belt causing a  
“sufficient” displacement “of water to increase the stability of  
“the vessel before getting way on her. In the upper surface of  
“the tubular vessel there are man holes, which are provided with  
“coverings of india-rubber cloth, or other suitable material, fur-  
“nished with strings or straps to be fastened to the body of the  
“man, thereby preventing the water from entering the vessel.  
“The mast and sails are made and arranged so as to admit of  
“their being hoisted by one rope.”

[Printed, 6d. Drawings.]

A.D. 1860, July 10.—N° 1662.

ZOUBTCHANINOFF, SWIATOSLAR. — (*Provisional protection only.*)—“An improved compound for the coating of wooden  
“ships, boats, and other structures, used at sea.” “The com-  
“pound with which I purpose coating ships, and all wooden  
“constructions for marine purposes, to preserve them from the  
“attack of worms and other deterioration, will be composed as  
“follows:—Bitumen, four parts (in weight), ordinary resin, four

" parts, essence or spirit of black turpentine, six parts, colza oil,  
 " two, and sulphuric acid or oil of vitriol, eight parts. The  
 " whole to be placed in a caldron, heated and mixed together."

[Printed, 3d. No drawings.]

A.D. 1860, July 14.—N<sup>o</sup> 1705.

CORNISH, SAMUEL TOM.—(*Provisional protection only.*)—" Im-  
 " provements in ships' closets," The invention consists " in  
 " the application of a slide valve or sliding plate for the purpose  
 " of closing the passage from the closet to the sea. This closet  
 " is principally adapted for emigrant ships, in which it is desi-  
 " rable to have the closet apparatus such that it shall not get out  
 " of order." The slide valve may be vertical, horizontal, inclined,  
 or in any other suitable position at the bottom of the pan.

[Printed, 3d. No drawings.]

A.D. 1860, July 25.—N<sup>o</sup> 1905.

LANCASTER, CHARLES WILLIAM; BROWN, JAMES; and  
 HUGHES, JOHN. -" Improvements in the manufacture of plates  
 " for coating or covering and strengthening ships and other  
 " structures, and in fixing the same."

The invention consists, first, " in manufacturing armour plates  
 " for the aforesaid purposes of a combination of different metals,  
 " the outer coating being of a soft fibrous nature, the middle  
 " layers of a hard character, such as of steel or homogeneous  
 " metal, and the inner coating or back surface of Brown and  
 " Hughes' iron or other like material. The plates are to be partly  
 " manufactured by hammering, and are then finished in grooved  
 " rolls, which are so arranged as to press upon and give shape to  
 " the edges as well as the surfaces of the plates. The edges are  
 " to be of such a form that they will dovetail or otherwise take  
 " into stringers formed to receive them. In some cases the  
 " plates may be entirely manufactured and shaped by either  
 " hammering or rolling only."

Secondly, " in fixing plates for the aforesaid purposes by means  
 " of stringers formed of rolled or hammered metal with broad  
 " flanges, similar to those of a bridge rail, and with dovetailed or  
 " other recesses to receive the plates. These stringers are placed

“ either perpendicularly, obliquely, or horizontally, and are to be  
 “ fastened to the ship’s side or other structure with conical-headed  
 “ bolts passing through the flanges, and so fitted that the action  
 “ of shot striking on the plates cannot disturb them. In some  
 “ cases we prefer to fix the plates inside ships at such an angle as  
 “ to throw off shot.”

“ Plates manufactured and fixed as herein-before described are  
 “ to be used for covering fortifications and land batteries, as well  
 “ as ships and floating batteries.”

[Printed, 1s. 10d. Drawings.]

A.D. 1860, July 27.—N° 1817.

CAMPBELL, WILLIAM.—(*Provisional protection only.*)—“ Im-  
 “ provements in the form of steam ships.”

“ The ship is divided by two longitudinal bulkheads; the center  
 “ compartment is formed with bows and cutwater, and with stern  
 “ and rudder. The side compartments do not extend the full  
 “ length of the ship. The paddle wheels are placed on each side  
 “ of the center compartment, where it is longer than the side  
 “ compartments. The end and bottom of each side compart-  
 “ ment projects partly under each wheel, is curved in form of a  
 “ recess for the wheel, and is sloped underneath to form a sub-  
 “ merged cutwater under each wheel. The paddle floats are fixed  
 “ obliquely and parallel to each other across the face of the  
 “ wheel.

The ship may either have paddle wheels at both bow and stern,  
 or only at the stern. In the latter case the bows may be formed  
 into a cutwater.

[Printed, 9d. Drawings.]

A.D. 1860, July 28.—N° 1835.

MORRIS, WILLIAM.—(*Provisional protection only.*)—“ Improve-  
 “ ments in the construction of ships or vessels, and in the mode  
 “ of propelling them.”

The invention consists “in the bottom or hull of the vessel  
 “ below the water line being curved upwards from amidships  
 “ longitudinally and transversely, with gradual curves, so that the  
 “ speed of the ship or vessel may be increased by reducing the  
 “ angle of opposition to the water, and the hull thereby rendered

“ better adapted for the employment of my improved direct-  
 “ action propellers, which consist of horizontal sliding frames in  
 “ connection with hinged leaves or floats, to which an alternating  
 “ movement is given through the medium of eccentrics in gear  
 “ with the driving shaft of the engine, the said engine being  
 “ actuated by means of a cylindrical boiler or generator furnished  
 “ with tubular return flues passing from the lower to the upper  
 “ surface of the said boiler, and thereby effecting economy in  
 “ space and fuel.”

[Printed, 3d No drawings.]

A.D. 1860, July 28.—N° 1837.

HAMILTON, JOHN, jun.—This invention has for its object improvements in steam vessels of light draught, propelled by a single paddle wheel. With this object “ I place the wheel in an  
 “ opening formed in the vessel, usually at a point some distance  
 “ in advance of the stern ; and behind the wheel I make a groove  
 “ or passage in the bottom of the vessel for the water to escape  
 “ from the wheel. This groove or passage is not made of sufficient depth to penetrate to any extent into the upper part of the  
 “ vessel above the water line, but usually I make the bottom of  
 “ the groove about to coincide with the ordinary draft line of the  
 “ vessel, so that under ordinary circumstances the part of the  
 “ vessel immediately behind the wheel does not enter the water,  
 “ but nevertheless if the vessel be heavily laden it becomes immersed and assists in supporting the load. I prefer that the  
 “ groove as it passes away from the wheel should expand or  
 “ become wider laterally to allow the water to escape more readily ;  
 “ and for the same purpose I cause the parts of the vessel on the  
 “ two sides of the groove to decrease in draft progressively in  
 “ passing from the wheel to the stern. If it be desired, as in the  
 “ case of a vessel having frequently to steam astern, the groove  
 “ may be continued to the bows of the vessel in advance of the  
 “ wheel, making the two ends of the vessel similar the one to the  
 “ other.”

[Printed, 1s. Drawings. See No. 817 (1860.)]

A.D. 1860, August 9 —N° 1935.

• NEWTON, ALFRED VINCENT.—*a communication from Sulvey Mason Stone*—This invention relates to “ the employment of an

“ air duct or passage heated by a flue, or a steam pipe passing  
 “ through it, in such a manner as to rarefy the air within it, and  
 “ create an upward current therein for the purpose of carrying off  
 “ the impure air from a building, ship, or mine, such air duct to  
 “ be in combination with another duct or passage for admitting  
 “ pure air to the building, ship, or mine, by which combination  
 “ a constant circulation and distribution of pure air to the space  
 “ requiring ventilation is obtained.”

[Printed, 7d. Drawings.]

A.D. 1860, August 27.—N<sup>o</sup> 2063.

BOUSFIELD, GEORGE TOMLINSON,—(*a communication from E. S. Renwick.*)—“The object of this invention is to diminish  
 “ the quantity of material required in building metallic water  
 “ craft, and nevertheless obtain increased strength, safety, and  
 “ carrying capacity by an improved distribution of the material.”  
 The proposed mode of construction dispenses with ribs, and also  
 with “knees at the ends of the deck timbers;” and the bulk-  
 heads, which are of the whole breadth and depth of the vessel,  
 are made so numerous as to perform the duty of ribs. The ma-  
 terial is thus “disposed in a form which imparts the greatest trans-  
 “ verse strength, and a much less quantity of material is required  
 “ to prevent the vessel from changing its shape transversely than  
 “ is necessary when the material is disposed wholly in ribs, or  
 “ mainly in ribs, with a few bulkheads, according to the old  
 “ system.”

[Printed, 6d. Drawings.]

A.D. 1860, August 30.—N<sup>o</sup> 2099.

NEWTON, WILLIAM EDWARD,—(*a communication from Thomas Schofield and Robert Schofield. Provisional protection only.*)—  
 “Improvements in floating structures.” The object of this inven-  
 tion is “to produce a floating structure on which the platforms  
 “ or roadways of bridges, lighthouses, piers, landing stages, and  
 “ other structures may be supported above water in places where  
 “ the depth of the water does not allow of the application of the  
 “ pillars or fixed foundations commonly used for such structures.”  
 It consists “in the employment for the above purpose of a series  
 “ of hollow globes or cylinders, which are steadied by balance  
 “ weights of a peculiar construction, and which are secured to the  
 “ ground by suitable chains and anchors. These hollow globes

“ or cylinders are also furnished with arms or standards which  
 “ extend upward for the purpose of supporting the roadway,  
 “ platform, or other structure to be erected above water. The  
 “ hollow globes or cylinders are also provided with valves and  
 “ pumps for removing the water which may find its way into the  
 “ interior of the globes or cylinders.”

[Printed, 3*d*. No drawings.]

A.D. 1860, September 13.—N<sup>o</sup> 2209.

THOMPSON, NATHAN, jun.—This invention has for its object improvements in boat-building and in apparatus used therein, and relates, first, to improvements in the apparatus described in the Specification of the Patent granted to George Tomlinson Bonsfield, dated 16th June 1858 (N<sup>o</sup> 1359). “ I employ in boat building a  
 “ frame constructed of suitable pieces of timber, generally about  
 “ four to six inches in width,” “ and about two inches in thickness;  
 “ they run in a direction from stem to stern,” “ and about ten  
 “ inches apart, and they are secured to chocks or pieces of timber  
 “ secured transversely, so that the whole when united shall form  
 “ the exact shape or form of the boat, and which I call the  
 “ ‘assembling form.’ At the gunwale parts of the form, and  
 “ running from stem to stern, is a ledge whereon the gunwale  
 “ rests, the pieces forming the gunwale being the first pieces laid  
 “ and bent upon the form. The keel is then properly placed and  
 “ fixed by screws or otherwise. The ‘risings’ which support  
 “ the seat are the next parts applied, then the gunwale is notched  
 “ and also the ‘risings’ to receive the ends of the ribs. It should  
 “ be stated that on the bevels of the pieces, which run longi-  
 “ tudinally, pins are inserted in a line that will represent the ribs  
 “ in the finished boat, and levers are also applied of such shapes  
 “ that when ribs are laid on to the form the ribs may be pressed  
 “ against the pins, and thereby retained, after which the floor  
 “ timbers are secured and cants to the ribs and the stem and  
 “ stern posts. By thus constructing and applying the ‘assem-  
 “ bling form’ I am enabled to get out all the fore and aft and  
 “ bulge timbers in halves, and to get out the floor timbers and  
 “ cants, and to secure them in the best possible manner upon the  
 “ ‘assembling form.’ By means of the assembling form also ribs  
 “ may be produced at any time of the exact form required to  
 “ replace damaged ribs, and the arrangement above described

“ allows of placing the gunwales, risings, wash streaks, feather  
“ bands, and mouldings, which could not be done according to  
“ the mode of construction adopted in the Specification of George  
“ Tomlinson Bousfield's Patent above referred to.”

2. “ To the making of ribs for boat building. For this purpose  
“ a number of blocks or forms of wood, or it may be of metal  
“ are used, each having one of its surfaces shaped in conformity  
“ with a finished rib. Or in place of making such blocks or  
“ forms to receive only one piece of timber to be bent thereon, it  
“ is sometimes found desirable to make such forms or blocks  
“ sufficiently long to admit of any desired number of pieces being  
“ bent thereon; in which case, each form or block is mounted on  
“ wheels running on a rail or tramway, so as to enable the parts  
“ of the form and each of the pieces of wood to be bent to be  
“ brought in succession beneath the bending apparatus. Each of  
“ such pieces of wood, after having been steamed, bent, and  
“ allowed to set into the proper form, is cut into three or more  
“ ribs according to the width of the piece of wood, each of which  
“ ribs varies slightly in bevil, and bend in order to suit it for its  
“ particular position in the boat. When ribs are both convex  
“ and concave, then blocks or forms are to be used, each of which  
“ has a convex surface and a concave surface, which are respec-  
“ tively counterparts of the concave and convex surfaces of the ribs.  
“ Each surface of a block is then to be fitted with a thin flexible  
“ metallic plate of the length of the rib which is fixed at one end  
“ to the surface of the form, and provided at the other end with  
“ some proper device to receive the end of the rib or piece of wood  
“ for several ribs.

“ In getting out the ribs, the first operation is to form,  
“ by sawing or otherwise, a plank into about the length of the  
“ ribs which are to be cut therefrom, having from end to end  
“ the thickness and taper of the ribs, and to plane the said plank.  
“ The next operation is to steam these pieces in any well-known  
“ manner. The third step is to place such pieces with their ends  
“ resting in suitably formed chocks or sockets attached to the  
“ ends of the flexible metal plates.” The plank is then bent by  
suitable apparatus on to the form, by which the plank is both bent  
and twisted, so as to assume the shape required. If a rib be of  
an S shape, that is, if it consist of a convex and concave shape,  
it is to be pressed between two surfaces or forms of the desired

convexity and concavity. After the planks are bent in the forms, they are to be left confined a sufficient length of time to dry and set to the required curve. The fourth step is to saw the bent planks into strips, and each strip will be proper for a rib properly tapered, curved, and bevilled. Lastly, the ribs are finished by planing on the two sides.

3. To a combination or arrangement of mechanism for bevilling the edges of the ribs or other parts used in building boats; the machinery being capable of producing different bevils or angles on the same rib or part, or different bevils on different ribs or parts, without any alteration or adjustment of the machine. The machine consists of a strong frame, supporting a table or platform. In proper boxes (attached to the frame and the table) is supported a shaft, which has keyed upon it a driving pulley, and has mounted upon its upper end a rotating cutter; between this cutter and the shaft is a bevilled collar, which may be a separate piece, or form part of either the shaft or the cutter. This shaft is set at an angle with the table, which may be made capable of being varied, and the cutter should overhang the table at an angle equal to the angle of the greatest or most oblique bevil required, and so that an imaginary line on the surface of the collar, which is coincident with a vertical plane passing through the centre of the shaft, should be at right angles or nearly so with the plane of the table, or in other words the collar should bevil or incline towards the shaft, at an angle greater than a right angle, by the number of degrees subtended by the angle between the table and the shaft. Under the overhanging parts of the shaft lies a fence, which is a piece of metal rising from the table, and bent so as to partially surround the cutter. The top of the fence should be as high as the greatest projection of the collar above the table.

This machine is to be used in connexion with a guide board or plate as thick as the fence is high, or nearly so, and whose edge is of the same contour as one of the edges of the ribs or plank to be bevilled. When the cutter is set in motion, the operation of the machine is as follows:—"A piece of wood is to be sawn out, " either straight or curved as required, and then is to be fastened " to the guide board or plate, the plate having, as before stated, " been curved to the line of the edge of the required bevil, if that " bevil is to be on a curved edge; if the bevil is to be on a straight " edge, the guide plank must be straight. The upper line of bevil

“ is then to be marked on the upper surface of the piece of wood  
“ to be bevilled, and if both wood and guide be moved along the  
“ table, the latter in contact with the collar, and in a line perpen-  
“ dicular to a vertical plane passing through the shaft, the lower  
“ edge of the rib or piece will be reduced to the shape of the  
“ guide, and its edge will be bevilled to an overhanging bevil  
“ equal to the overhang of the shaft. In places where the line  
“ struck on the upper edge of the board lies inside of the edge  
“ thus made, the overhang is to be reduced by moving the guide  
“ along in other directions along the table, it being plain that the  
“ edge formed on the rib or plank will be vertical, if both guide  
“ and board are moved in lines parallel with a vertical plane  
“ passing through the centre of the shaft, and that the board will  
“ be sloped inwards from bottom to top at the greatest angle, if  
“ the guide be moved in contact with the rest or fence, and in a  
“ line perpendicular to that passing through the shaft, as before  
“ named, and that various bevils either overhanging or retreating  
“ may be cut by feeding the guide in lines at angles to those  
“ already named; after shaping the lower edge of the piece by  
“ the guide and with the greatest overhang all that the workman  
“ has to do is to follow around the cutter moving the piece of  
“ wood and guide in various lines until he cuts up to the guide  
“ line. Where the bevil in a rib plank is to be throughout its  
“ length at the same angle I can dispense with a guide line on  
“ the upper side of the board, and direct the course or direction  
“ of the guide by lines drawn on the surface of the table, and  
“ each marked with the angle at which a bevil will be cut by  
“ passing the guide along each line. From the foregoing it will  
“ be evident that the collar is useful in cutting the overhanging  
“ bevils, and that the fence is useful in cutting the retreating  
“ bevils, and that either the collar or the fence may be dispensed  
“ with when the nature of the work is such that only one kind of  
“ bevil is to be produced.”

4. To apparatus or forms by means of which the edges of the planking for boats may be bevilled, and brought to a proper curve at the same time, with accuracy and dispatch; planks for small boats being of necessity curved along their edges, in order to accommodate them to the shape of the bottom of the boats, and having a continually varying bevil on their edges, so as to fit close to the next planks. The apparatus consists of a bed

or support for the plank to be worked; of an edge guide for controlling the plane, so that it shall cut the plank to the proper curve; and of a surface guide for so controlling the same instrument, that the plank shall receive its proper bevel at the same time that its curve is worked out. The bed or support for the plank is furnished with small pins or points for steadying the plank, and the edge guides are to be formed of the precise curve of the plank required, and project upwards at right angles from the surface guides. The surface guides are to be worked out into a warped surface, the peculiarity of which is that lines drawn on it perpendicular to the edge guide or nearly so at any point, shall also be at right angles to the bevel required at the same point. "As a means of economizing the cost of the construction of the apparatus, I make both edge and surface guides on the two sides of the same bed piece, so that both edges of a plank may be worked without removing it from the pins, and I also construct on the reverse side of the same beam other edge and surface guides and another bed. The instruments to be employed are ordinary planes, which are to be laid with one side held firmly in contact with the surface guides," "and with the bottom in contact with the edge guides, or as nearly so as the plank will permit."

5. To apparatus for reducing planks, so that when worked they shall have a warped or twisted surface. "This apparatus is devised with special reference to the working of planks for planking boats, such planks having a twisted or warped surface on both sides, the one irregularly convex, and the other irregularly concave, the latter being applied to the ribs or timbers of the boats which have convex curves of different curvature at points equidistant from the keel but at varying distances from the bow or stern of the boat. A plank in order to fit the various ribs to which it is attached must have a convexity or guttering of different extent at different points of its length, and in order to make the boat fair with the lines on its planking corresponding to those that can be drawn over its ribs, the outer surface of the plank should be parallel to the inner surface, or nearly so. The apparatus in its essentials consists of one or more rotating cutters arranged in a frame constructed in such manner that it can be turned or rotated about on axes; this is combined with a stationary table or equivalent support, along

“ which the plank to be worked is to be fed by any proper  
“ machinery, and the cutters’ axes must have knives of such  
“ a shape as will cut the one a concave and the other a convex  
“ surface.” “ A circular plate or table on suitable standards is  
“ used, and other standards support the ends of a feeding table,  
“ and their other ends rest upon and are secured to the circular  
“ plate. Just above the bed plate is secured a circular guide and  
“ support, whose centre is vertically under the centre of the  
“ circular plate. The two circular plates are embraced by two  
“ posts, which are secured to moveable circular plates resting  
“ upon the upper and lower stationary circular plates, and pro-  
“ jections, if deemed necessary, may extend from the posts under  
“ either or both of the stationary circular plates; or the inner  
“ edge of the lower moving plates may enter notches in the posts.  
“ These posts are framed together at the top, and are fitted with  
“ boxes, slides, and adjusting apparatus carrying and governing  
“ two rotating cutters, one being so shaped as to cut a gutter or  
“ hollow in a plank submitted to its action, and the other is so  
“ formed as to round up at the centre any board that may be  
“ passed over it. Between the two circular plates a shaft is sup-  
“ ported in boxes in the posts, and at the centre of this shaft  
“ measuring between the boxes is a pulley turned off, so as to be  
“ a portion of a spherical surface, or nearly so, and at the outer  
“ end of this shaft is another pulley carrying a belt, which passes  
“ over a tightening pulley and partially around two other pullies,  
“ each secured at the end of one of the shafts that carries a  
“ cutter; the whole arrangement being such that the lower shaft  
“ may be revolved by a belt, although this shaft may change its  
“ angular position relatively to the shaft which drives, and such  
“ that the shaft shall, through the instrumentality of belts and  
“ pullies, cause the cutters to revolve. The stationary circular  
“ plates serve as guides and supports for the moveable circular  
“ plates, and consequently for the posts and the frame and cutter  
“ that they convey, and the posts, framing, and cutters are free  
“ to revolve around the stationary plates, and consequently around  
“ the centres of the circles of the shafts, a line passing through  
“ which would pass through the centre of the cutter shafts, or  
“ nearly so. One end of a cord of hemp, wire, or catgut is  
“ secured to one of the posts, passes partially around the upper  
“ moving circular plate, then completely around a small pulley

“ on an upright shaft provided with a hand wheel, and then  
“ partially around the same circular plate to the other post,  
“ to which the other end of the cord is to be secured, and  
“ the whole is to be drawn tight. By turning the hand wheel,  
“ the posts, frame, and cutters may be turned, so that the axes  
“ of the cutters may form different angles with a line drawn  
“ along the edge of the feeding table. On one side of the  
“ feeding table is fastened an adjustable guide, and the tables  
“ or the front and rear ends of the table are bevelled off so as  
“ to allow the lower cutter to turn with the posts and moving  
“ circular plates. A rest bar stands just in front of the lower  
“ cutter, it is attached to the posts, turns when they are turned,  
“ and its upper surface, when properly adjusted, should be level  
“ with the lowest depression of the concave cutter. Over the rest  
“ the plank to be planed passes on its way from the front part  
“ of the table to the cutters. Directly above this hangs a strong  
“ and heavy swinging shield. This shield is pivotted upon the  
“ posts, and turns when the posts turn, and bears with its whole  
“ weight, or nearly so, upon the upper surface of the plank which  
“ is being planed. It serves therefore as a pressure bar to hold  
“ the plank while being cut, acting as pressure rollers or bars  
“ act in planing machines. The concavity and convexity of the  
“ cutters which are to be used must be governed by the shape  
“ desired to be produced, and they should be counterparts of  
“ reverses of the smallest amount of concavity and convexity  
“ required in the plank to be shaped. Before planing and  
“ reducing a plank, the desired shape must be known, and a  
“ calculation made as to how far the rollers must be turned, or,  
“ in other words, at what angle they must stand to the line of  
“ travel of the plank, in order to produce the required degree of  
“ convexity and concavity at different parts of the length of the  
“ plank. The plank is then to be laid on the table and moved  
“ through the machine, and while it is being reduced the operator  
“ must, by means of the hand wheel, turn the cutter frame as  
“ required. The result will be a plank having on both sides a  
“ warped surface, if both convex and concave cutters are employed,  
“ or if two convex or two concave cutters are used, if one convex  
“ or one concave cutter is used either in connection with a re-  
“ sisting surface or with a straight cutter, then the plank will  
“ have a warped surface on one side only.”

6. "To machinery for planing, moulding, grooving, rabbetting, and bevilling wood suitable for boat building. For these purposes rotary cutters are employed carried on axes, one or more of which are so mounted as to be capable of being moved on centres at right angles to the direction of their length, by which the cutters may be made to approach the wood obliquely, and so cut such side or face of the wood at an angle to its other sides. In machines for planing, according to this invention, the cutters are arranged on three sides of the wood to be planed, so that all the three sides are operated upon simultaneously, and provision may be made, if desired, for introducing a fourth pair or set of cutters, so that all four sides of a piece of wood may be planed at the same time. The feeding in of the wood to be planed or moulded is made self-acting, and the feeding mechanism is driven by bands and gearing in the ordinary manner, and the gearing is so arranged that the feed may at any time be stopped without stopping the working of the machine." If it be desired to produce mouldings on one or more sides, or on all four sides of the wood, the plane cutters from such sides are removed, and cutters of the form of moulding desired affixed to such axes in lieu thereof.

In order to cut or form slots or grooves (having parallel sides) of any desired width or depth, a circular saw of a peculiar character is employed. This saw has some of its teeth filed or bevilled off on one side, and some of its teeth filed or bevilled off on the opposite side, so that these teeth will "chime" or cut each side of the groove, slot, or channel to be formed, whilst the wood between such two outside cuts is removed by the straight teeth of the saw; and in order to cut grooves, slots, or channels of greater width than that of the saw just described, the saw is so mounted on its axis that it can be set at an inclination thereto, by turning a screw with a spanner or wrench, the thread of the screw working in a female screw formed to receive it in the thickness of the saw. The boss of the saw is a portion of a sphere, and is held between two corresponding cheeks, within which it is capable of travelling the required distance to give the inclination to the saw.

It is sometimes necessary to form a rabbet along a portion of a length of wood, and then to discontinue it; as in the formation of the keels of boats, it is necessary to cut a rabbet on each side of the stem and stern portions, and yet not to extend it more

than a slight distance along its sides, and such portions of the keel are generally slightly bevilled so as to improve the cutwater. These are tedious operations when they have to be performed by hand, but by this improvement the required bevilling and rabbetting for keels of boats is readily obtained.

The machine is made capable of turning upon a centre, and is mounted on wheels, which travel on circular tramways or tracks attached to the flooring for that purpose. By thus turning the machine the curved portions of a keel, stem, and stern may as readily be operated upon as the straight portions.

[Printed, 4s 1d. Drawings.]

A.D. 1860, September 21.—N<sup>o</sup> 2303.

SMITH, ROBERT — "Covering of iron and wooden ships, yachts, steamboats, and barges' bottoms and outside." This invention consists in "the application of sulphur rendered soluble, or such as can be held in solution, in conjunction with asafetida, pitch, tar, rosin, turpentine, and, if necessary, white lead and paint of any description, or with any other known adhesive ingredient," for the purpose of "preserving iron and wooden ships, yachts, steam vessels, and barges' bottoms, both inside and outside, and also for the preservation of metal, wood, or stonework of any description, whether used on land or in water."

[Printed, 3d. No drawings.]

A.D. 1860, October 8.—N<sup>o</sup> 2434.

BRIGHT, HENRY. — (*Provisional protection only.*) — "An improved guard or cutwater for ships or vessels, for the purpose of lessening or preventing injurious effects resulting from collision." "The apparatus is composed of a series of timber built skeleton triangles arranged in a horizontal plane, and placed tier above tier in as many tiers as may be found desirable, each tier consists of triangles which are graduated in size, the smallest being placed foremost. These triangles are intended to give way in succession in case of a collision, and are therefore placed so that the base of each, beginning with the foremost triangle, bears against the point or apex of the one immediately behind it. Each triangle is supported at its

“ place independently by means of stays connecting it with the  
“ ship, the base of each hindmost triangle bearing athwart that  
“ part of the vessel which in ordinary cases forms the cutwater.  
“ To prevent the apparatus being twisted to either side, the ends  
“ of each triangle are tied by iron rods passing through the one  
“ behind it, which are free to be driven backwards so as not to  
“ injure the rear triangle in case of collision. Strong spiral or  
“ other springs are fitted within the said skeleton triangles to  
“ add elasticity to each in case of fracture.”

The apparatus is “entirely enclosed by a suitable casing, which  
“ takes the form of and serves as a cutwater for the ordinary  
“ purposes of navigation, but is intended to give way in case of  
“ a collision, and save the hull of the vessel to which it is attached,  
“ or if the collision be against another vessel to save both.”

[Printed, 3d. No drawings.]

A.D. 1860, October 9.—N<sup>o</sup> 2447.

PRICE, GEORGE.—(*Provisional protection only.*)—“ An improve-  
“ ment in the manufacture or construction of metallic armour for  
“ vessels of war, land defences, shields for ordnance, mantellets,  
“ &c.” The invention “consists of combining steel and wrought  
“ iron in such a manner as when formed into plates or slabs for  
“ the outer covering of the sides of vessels of war, or for the  
“ casing or covering of land defences, or for shields for ord-  
“ nance,” “or any other kind of defences for the resistance of  
“ shot or shell fired from any description of ordnance, that the  
“ said plates or slabs of combined steel and wrought iron shall  
“ the better resist breakage or penetration by shot or shell than  
“ either steel or wrought iron when used singly and alone. I  
“ produce wrought-iron plates or slabs with a surface of steel on  
“ one or both sides, and of any required thickness in the course  
“ of their manufacture, i.e., by piling the iron and steel together  
“ to form the ‘pile’ or ‘billet’ of which the plate or slab is  
“ produced by passing through the rolls. Any desirable kind  
“ or quality of steel may be used, and the hardening of the steel  
“ surfaces may be effected by any of the usual methods employed  
“ in hardening steel.”

[Printed, 3d. No drawings.]

A.D. 1860, October 9.—N<sup>o</sup> 2452.

REID, GEORGE.—(*Provisional protection only.*)—This invention relates to “various devices for ensuring better ventilation and  
“ maintaining a supply of fresh air in houses, buildings, ships,  
“ and structures generally, and to the construction of an appa-  
“ ratus which I have designated the ‘carbon test,’ for ascertaining  
“ the state of the atmosphere in any place with a view to the  
“ better ventilating and supplying of fresh air.

“ The feature in my invention which distinguishes it from those  
“ at present in use consists in using two or more shafts placed at  
“ a distance from each other, the one (or more) to serve as inlet,  
“ the other (or more) as outlet.” “On all the inlet and outlet  
“ passages, whether opening outwards or upwards, I place a  
“ guard or fender of an ornamental character, suited to the style  
“ of the building, so arranged that it will admit free ingress and  
“ egress of pure and vitiated or heated air, as desired.”

“ In my arrangements for ships I use tubes or shafts of dif-  
“ ferent lengths alternately from the various decks, open at the  
“ lower ends, and communicating with one or more passages or  
“ flues, terminating in a suitable receiver or rarefier formed round  
“ or near to the funnel or chimney, into which latter, or through  
“ one of my guards or fenders, I exhaust the foul air. The same  
“ arrangement could be used for maintaining an uniform tempe-  
“ rature in the cabins by fixing a fan in the passage or flue,  
“ which, when put in motion, would force the air through the  
“ tubes.

“ The ‘carbon test’ is formed of glass or other transparent  
“ substance; on one side near to the bottom is affixed a tube,  
“ which rises upwards from the bottom in the form of an S; on  
“ the other side and near to the top is a similar downward  
“ shaped tube, these tubes being the only communications with  
“ the interior; the form is peculiarly suitable for testing a small  
“ quantity of air from a bladder or other holder, the inlet in all  
“ cases being under the level of the testing liquid.”

[Printed, 3d. No drawings.]

A.D. 1860, October 15.—N<sup>o</sup> 2509.

SINGER, ISAAC MERRIT.—“Improvements in the construction  
“ and fitting of steam vessels.” “The chief object of this in-

“vention is to prevent the rolling of sea-going vessels, by  
“providing them with a breadth of beam that will practically  
“neutralize the action of the waves when striking the side of  
“such vessels. This arrangement will also enable me to increase  
“the” accommodation “for passengers. To this end I propose  
“to group three hulls of suitable shape, side by side, and to  
“connect them together by suitable bracings above, and if  
“necessary below the line of flotation, leaving sufficient space  
“between the hulls to afford good passage ways for the water.”  
It is preferred that the middle hull shall be longer than the side hulls. Athwart these hulls on a platform formed by the lower bracings, lines of saloons or state cabins are arranged, which bridge over the spaces between the hulls; these saloons are arranged in two tiers and in parallel lines over the whole of the available deck or platform space, the centre of the vessel being occupied by engine room, ships’ stores, &c.

Between the hulls, at about the middle of their length, it is proposed to mount a pair of paddle wheels, driven by means of steam engines contained in the middle hull. In some cases the paddle-wheel shafts are to be continued through and beyond the side hulls, for the purpose of receiving side propellers. If thought desirable for the sake of speed, stern screw propellers may be fitted to the side hulls, and driven from engines in the side hulls or in the middle hull. These screw propellers, and also the side paddles, when the same are used, may be made to unship in case of a storm coming on, the propulsion of the ship being then kept up by the paddle wheels between the hulls.

“As the ordinary mode of steering vessels by a rudder at the  
“stern may not suffice for this novel construction of compound  
“vessel, more especially when moving in narrow waters, I provide at the opposite ends of the central hull a pair of engines,”  
“for driving respectively a propeller shaft mounted in a line with  
“the keel of the hull. These shafts I fit each with a paddle wheel  
“or other propeller, the same being intended to steer the vessel,  
“either singly or simultaneously, as desired. When the vessel is  
“at sea, it will be desirable to raise one and occasionally both of  
“these steering paddle wheels out of the water,” for the performance of which operation, proper provision is made.

[Printed, 9d. Drawings.]

A.D. 1860, October 18.—N° 2550.

DUKE, JAMES.—(*Provisional protection only.*)—Improvements in the construction of life and other boats. These boats are constructed with two air-tight skins, both formed of two or more thicknesses of planking, but without ribs. The inner skin may extend up to the gunwale, or may terminate at the thwarts or other point below the gunwale; and the two skins are bound together by suitable timbers, to maintain the rigidity and stability of the boat. "The main keel extends from the inner skin and " passes down below the bottom of the boat; there are further " two sister keels, or kelsons, or timbers, running parallel with " the keel, and separated some few inches from the keel; these " kelsons in depth extend from the inner to the outer skins, and " the spaces between them and the keel are open to the water " below. The keel and kelsons are firmly bolted and stayed at " intervals throughout their length. The depth between the " outer and inner skins of the boat is such that her load-water " line is some inches below the bottom of the inner skin. The " inner skin has numerous holes in the bottom communicating " with the spaces between the keel and sister kelson, whereby any " water shipped finds immediate escape. These kelsons may be " continued throughout the length of the boat, but, by preference, I continue them only about three-fifths the length of " the boat, leaving a short space at each end above which a deck " is formed level with the thwarts, the whole of the space below " such decks being air spaces for the buoyancy of the boat. " The water spaces on each side of the keel before mentioned " are necessarily co-extensive with the kelsons, which are so " arranged that the longitudinal water spaces are narrowest at " bottom and extend in width towards the upper part. In this " construction of boat it will be observed that there is always " contained an amount of water in the spaces between the keel " and sister kelsons, which has the effect of ballast on the boat, " which is at same time free to escape from such spaces below, " and these spaces further afford the necessary passage through " the bottom of the boat for the escape of the water shipped, " which escape can be formed of any desirable extent."

[Printed, 3d. No drawings.]

A.D. 1860, October 19.—N° 2556.

MOY, THOMAS, and WARDROPER, FREDERICK BAYLY.—*(Provisional protection only)*.—This invention “has reference to  
“ flat-bottomed vessels of great length and breadth, but of small  
“ draught, adapted for navigation in shallow rivers, and consists  
“ in forming the bows or front part of such vessels with a con-  
“ cave surface, having a tendency to raise and turn the water  
“ at each side of the stern or cutwater instead of, with the  
“ usual convex surface of the bows, with a tendency to displace  
“ the water by pressing upon it. By this improved form of the  
“ bows the vessel is not required to be narrowed in front in the  
“ usual manner to give speed; but the flat or nearly flat bottom  
“ of the vessel is carried forward to the extreme limit of the  
“ stem or cutwater of the full breadth of beam, also without any  
“ rise of floor. The fore edge of the bottom is formed as sharp  
“ as is practicable, and the corners of the same are slightly  
“ rounded in cases wherein the structure would otherwise be too  
“ thin. The stem rises vertically from the bottom, the front of  
“ which stem or cutwater forms a narrow ridge at right angles  
“ with the fore edge of the bottom. The form of the concave  
“ surface of the bows may be varied, but we prefer that it should  
“ be spiral, so as to be capable of acting on the water in a manner  
“ somewhat analogous to that of a plough on the earth. The  
“ form of the stern may be varied, but we prefer to form it with a  
“ rising floor on cycloidal lines.”

[Printed, *3d*. No drawings.]

A.D. 1860, October 20.—N° 2559.

YOUNG, WILLIAM.—*(Letters Patent void for want of final specification.)*—“The sides of ships have been covered with plates  
“ of iron of great thickness to prevent shot or other warlike  
“ missiles penetrating them. Now, in order to obtain the greatest  
“ effect from the weight of metal used, I propose to use, in  
“ combination with the ribs or framings of a ship or vessel, metal  
“ plates or girders placed at certain distances apart from each  
“ other, and to fill these spaces between the said plates or girders  
“ with material of a less specific gravity than the metal used; or  
“ I fill these intervals partially with smaller plates or girders of

" the same metal, and partially with material of a less specific gravity. In some cases I use metal plates pierced with holes of suitable size, which I also fill in the manner above described. I further propose constructing or protecting the decks of a ship or vessel by a similar method."

[Printed, 3d. No drawings.]

A.D. 1860, October 20.—N° 2560.

ASH, JAMES.—(*Provisional protection only*)—" Improvements in the construction of iron ships." The invention consists in a method of attaching the bulkheads in iron ships to an inner frame or plate instead of to the ship's sides proper, as is now done. For this purpose I connect an inner plate or skin by means of angle irons, or otherwise, extending all round the ship from side to side, a space being left between the plates and the sides of the ship, and I then carry the bulkheads across from plate to plate."

[Printed, 3d. No drawings.]

A.D. 1860, October 22.—N° 2576.

HART, GEORGE WILLIAM.—" Improvements in the construction of vessels of war," and in propellers for the same. The first part of the improvements in the construction of vessels of war relates to the ports. " In lieu of the present shaped ports, which are rectangular, I make circular apertures in the sides of the vessel, into which I fix either entire spheres or such parts of spheres as are most suitable for the purpose, and which spheres work and are capable of being revolved and are held within the said circular apertures by what is commonly known as the ball-and-socket joint; and I make a suitable perforation through the said sphere for the purpose of running the gun through and firing through the said apertures in any direction without permitting shot or shell from without to enter "

Secondly, " in order to prevent damage to the rudder or rudder post by shot, I cause the upper portion of the rudder to be carried through a shaft at the stern part of the vessel in such way that it is protected from damage by shot, and in some cases, where required, I prefer to hang the rudder within the dead wood of the vessel instead of attaching it to it in the usual way." A method is described of fitting and working

two iron rudders in wooden ships, one on each side of the dead wood. For this purpose an iron rudder post in the shape of a band, passes down one side, under the keel, and up the other side of the dead wood, serving at once to hang the rudder on, and also to strengthen the dead wood where it is at present so much weakened by the channel for the propeller shaft. The rudders are hung in the usual way, and an arrangement is made, by which the ordinary steering wheel is made to move one or the other rudder from the fore and aft position, as may be necessary in steering the vessel.

It is also proposed so to construct the funnels of ships of war that no shell may be thrown down them, “which purpose I effect  
“ by inserting in the said funnel or chimney at or about the height  
“ of the deck a series of tubes, scrolls, sheets, bars, or plates of  
“ iron or other metal, in any suitable form which shall effectually  
“ prevent a shell from being thrown down the said funnel into  
“ the interior of the ship, where the explosion of it would pro-  
“ bably cause an explosion of the boilers and the consequent loss  
“ of the vessel.”

“The screw propeller I prefer to make of such form as that  
“ the portion of each blade nearest the shaft shall merge gra-  
“ dually into the circumference of such shaft instead of forming  
“ a radius to it as at present, and the outer end of each blade or  
“ the part furthest from the shaft shall recede gradually from  
“ such shaft and the face of such blade, at the same time  
“ gradually rising from being parallel to the shaft, until at the  
“ termination of the blade it forms a radius to the shaft either at  
“ right angles or inclined towards the stern or forward part of  
“ the shaft, as preferred.”

[Printed, 1s. 4d. Drawings.]

A.D. 1860, October 23.—N<sup>o</sup> 2584.

LUNGLEY, CHARLES.—“Improvements in the construction  
“ of iron ships and other vessels for the purpose of rendering  
“ them unsinkable and increasing their strength.” The first  
part of the invention consists in dividing the lower part of the  
ship or vessel into two or more water-tight compartments, by  
horizontal and other partitions, and “in affording access to  
“ these compartments for the introduction of cargo or stores by  
“ means of water-tight trunks or passages led up from them to

" such a height that their upper or open ends shall never in any  
 " practicable position of the ship be brought quite down to the  
 " level of the water. Compartments thus formed may be used as  
 " ordinary cargo spaces, store rooms, chain lockers, or for any  
 " other like purposes, and may be ventilated by suitable trunks  
 " or tubes, always providing that all trunks or tubes of every  
 " kind which enter them shall be made water-tight, and shall rise  
 " to the height before mentioned, in order that if by any mis-  
 " chance any compartment should be broken into, and the sea  
 " be admitted to it, the water should have no means of escaping  
 " therefrom into any other part of the ship." "The space occu-  
 " pied by the engines and boilers of a steam vessel I close  
 " entirely in by water-tight iron walls or bulkheads extending to  
 " the same height above the water line as the trunks before re-  
 " ferred to, in order that this space may be converted into a  
 " water-tight compartment, from which water could not escape  
 " into any other part of the ship, and into which water could not  
 " enter from any other part." "I form divisions by bulkheads  
 " across the ship above the skins, which I term 'between-deck  
 " ' bulkheads,' and which also are made perfectly water-tight,  
 " and so as to divide the between-deck space in such manner that  
 " should the vessel ship seas or otherwise get water on board  
 " it may be confined to the part where it enters."

"The next part of my invention comprises several modes of  
 " combining the parts of iron ships or the iron parts of ships,  
 " so as to increase their strength. In the first place I form a  
 " shelf below the iron beams of a ship by rivetting a longitudinal  
 " iron of a Z or angular form in section along the under sides of the  
 " beams, and a second iron of a somewhat similar form along the  
 " ribs or side of the ship, and then rivetting to these irons an  
 " inclined longitudinal plate to form the front of the shelf. In  
 " order to further increase the strength, I sometimes apply trans-  
 " versed plates to the sides of the beams and to the shelf by  
 " means of angle irons, where necessary."

(In the provisional specification the inventor says:—"In order  
 " to improve the connection of either transverse or longitudinal  
 " bulkheads with the ship's side, I employ two pairs of angle  
 " irons one on each side of the bulkhead, so that while the  
 " strength of the connection is increased, provision may be made  
 " for a slight spring or elastic play of the parts in order to pre-  
 " vent the evil effect of an excessively rigid connection between

“ them. I sometimes employ in place of angle irons copper  
“ curved plates rivetted on one edge to the ribs or side, and  
“ secured on the other to the bulkheads.” No reference is made  
to this improvement in the final specification.)

“ In the next place, where great strength is required, as in  
“ vessels for offensive or defensive purposes in war, where they  
“ require to be shot or shell proof, or to resist the shock of  
“ running into other vessels, or of breaking booms or harbour  
“ barriers, or as in vessels which are required to break or move  
“ through ice, or wherever very stout iron and extraordinary  
“ fastening are necessary to prevent the different pieces of material  
“ of which the structure is composed from being displaced for a  
“ considerable distance round the place which may be struck, I  
“ propose to build the vessel at and near the part where the  
“ strength is necessary, and, if necessary the whole of the vessel  
“ (even the decks if it should be required to make them shot  
“ and shell proof) in the following manner:—I employ two or  
“ more thicknesses of plating strengthened by longitudinal and  
“ transverse webs and stringer plates, secured to and at the joints  
“ of the thickest plating of the shell or skin of the ship, which  
“ is made as thick as is necessary to resist the blow which it is  
“ designed to receive.” The centre parts of these plates are  
worked, forged, or rolled, of greater thickness than the edges, in  
such manner as to make the centre part of the plate able to resist  
a blow equally with the parts near the edges; or they are made of  
a parallel thickness, when economy in weight is not required.  
“ The edges of these thick plates are usually formed on the inside  
“ with flanges, webs, or angle pieces in such a way as to fit  
“ against the longitudinal and transverse webs or stringer plates,  
“ and receive the fastenings. But in some cases I fit and secure  
“ angle iron to them near the edges for such purpose.” “ These  
“ thick plates can be worked either longitudinally, or vertically,  
“ or transversely. The longitudinal and transverse webs or  
“ stringers I secure to each other by fastening them to angle  
“ irons either on one or both sides, the inner edges being  
“ strengthened by bulbs, flanges, or angle irons forged on or  
“ fastened to them. The outer edges of the webs or stringers  
“ can be carried through the joints of the thick plating with a  
“ bulb or swell on the outside,” or they can be butted against  
them or into a rabbet or groove on the edges. “ I prefer also to  
“ work outer plates of such thickness or substance as shall give

“ the necessary tensile strength for holding the joints of the thick  
 “ or inside plating together in an efficient manner. I prefer  
 “ working the outer thickness or thicknesses of plating longi-  
 “ tudinally, and so that the joints of one thickness shall cover  
 “ the joints of the other in a similar manner to that adopted in  
 “ the planking of two thicknesses in vessels built of wood.

“ The fastening of such a vessel or of the parts of such a  
 “ vessel as may be required to stand concussion or blows, I  
 “ prefer to be screw bolts with a thread cut in the whole length,  
 “ and screwed into holes tapped or screw cut the whole length  
 “ through or into either plating,” “ angle iron, flanges, iron bars,  
 “ or even through or into wood where it is necessary to use that  
 “ material for the sake of economy or from any other cause. By  
 “ this means the danger of bolt or rivet heads being broken off,  
 “ or of the bolt or rivet being driven or drawn through the hole,  
 “ is obviated. Such bolts or rivets can only break at the joints  
 “ of the material through which they are placed as fastenings,  
 “ and can only be got out by unscrewing or by being cut out by  
 “ the drill or chisel.”

Lastly, “ I form the berthing of a ship so as to form a hollow  
 “ girder,” consisting of outer and inner plating surmounted by a  
 rail, the lower edge of the inner plating being rivetted to one  
 flange of a channel or trough iron, which is secured down to the  
 beams, and forms a watercourse along the side of the deck. This  
 hollow girder may be divided by partitions, and used as tanks for  
 waterclosets, signal lockers, hammock berthing, or for other like  
 purposes.

[Printed, 1s. 5d. Drawings.]

A.D. 1861, October 30.—N<sup>o</sup> 2658.

TRIBE, THOMAS—(*Provisional protection only.*)—“ Improve-  
 “ ments in ships’ berths, bedsteads, and sofas ”

These improvements consist in “ supporting the part on which  
 “ the cot or sleeping berth rests at its ends on gimbals or pivots,  
 “ so that the same is free to turn as the vessel rolls, and maintain  
 “ a horizontal position.” “ In special cases in order to ease the  
 “ motion of the said berth fore and aft as the vessel pitches, its  
 “ two ends pitch against springs with which it is furnished.”

[Printed, 3d. No drawings.]

A.D. 1860, November 1.—N° 2670.

DAHMEN, MATHIAS ANTHONY JOSEPH.—(*Provisional protection only.*)—"Protecting ships and other vessels, buildings, works of construction, and other bodies."

"I take plates of iron, steel, or other material, of a square, parallelogram, or other shape, and of external form suited to the purpose for which they are intended, and for the purpose of securing them in position I rivet or otherwise secure thereto bolts of suitable length, parallel and true to the extent of the travel or amount of motion of which they are capable, for the purpose of enabling them to slide back and forth, either in holes suitably prepared, or in tubes or ferules, and around any suitable part of each of such bolts, either alone, or in addition to other elastic material disposed behind each plate, I place or provide spiral or other form of springs, or elastic or other material, for the purpose of pressing back or returning the plates into their normal position, and the inner ends of such bolts may be screwed and have nuts thereon, or slots with cotters or keys. The plates may either be plain, of the ordinary form, and with square or rounded edges, or they may have a flange, either square or curved, or of other convenient form or section, so as to form a series of cells within which the springs, or elastic pads, or bedding, may be disposed.

"For protecting ships of war, and for other such purposes, I prefer to externally cover the iron plating (provided with elastic backing as described) with hard wood."

[Printed, 3d. No drawings.]

A.D. 1860, November 6.—N° 2715.

VAUGHAN, EDWARD PRIMEROSE HOWARD.—(*Provisional protection only.*)—"An improved plug for boats." "The plug is formed of two portions, the outer part consisting of a short cylindrical tube, the upper part of the interior of which has a collar fitted or formed therein, such collar having a slot passing through the same for the admission of the stud herein-after mentioned. The tube is furnished at the upper part thereof with a bevilled seating, and with a flange or plate for the purpose of fixing the tube in the bottom of the boat. The other portion of this contrivance, and which constitutes the moveable plug, herein-after mentioned, consists of a cylindrical piece of

“ metal or other material fitting into the before-mentioned  
 “ internal collar, and being provided with a stud or projection on  
 “ the lower part thereof. The upper part of the moveable plug  
 “ is formed with a bevelled lip or shoulder fitting accurately into  
 “ the before-mentioned bevelled seating in the tube. The move-  
 “ able plug is put in position by passing the stud through the  
 “ slot in the internal collar, and then turning it under the same  
 “ in the same manner as a bayonet joint is operated. At the top  
 “ of the moveable plug is placed a knob, ring, shackle, or chain,  
 “ or other contrivance for actuating the moveable plug, which is  
 “ also secured by a chain, the whole arrangement forming a per-  
 “ manent fitting in the boat. The plug may, if desired, be  
 “ reversed in position, in which case the water will press the  
 “ moveable plug upwards against the bevelled seating, thus giving  
 “ additional security against leakage. When thus constructed  
 “ the knob, ring, shackle, or chain, or other contrivance is at-  
 “ tached to that part of the moveable plug which is upwards, the  
 “ moveable plug being actuated from the inside of the boat.”

[Printed, &c. No drawings.]

A.D. 1860, November 15.—No 2810.

GILL, GEORGE.—(*Provisional protection only.*)—“ Improvements  
 “ in ‘ steam rams ’ and other ‘ ships of war. ’ ”

For the purpose of injecting molten iron, molten metal, liquid fire, and under some conditions steam, directly into the enemies’ ship, without the hazard of setting the “ injecting ship ” on fire, the inventor proposes to attach to the foremost part, or to build up from the stocks as a part and parcel of such vessel, an “ iron “ beak or spur ” of a conical shape, stretching forward from the stem or cutwater, and tapering down to almost a sharp point in front. The said beak or spur to be constructed of iron or steel, or both combined, and to have a channel or passage running through its body (longitudinally) from its “ base,” or part next the stem, to within a short distance of its extreme end, terminating in two openings, one on either side (right and left) of the spur, and at right angles with its central or main passage, through which any one or more of the fused elements above referred to are injected, care being taken that such channel or passage is bored or made parallel with the upper surface of the cone or spur (when fixed), and not in a line or parallel with the

axis of it. By such arrangements it will at once be seen that the outlets near the end of the spur are somewhat lower than the inlet at its base, facilitating thereby the more rapid flow of the fused elements, whatever they may be.

“To secure the instantaneous ejection of the fused elements at any given moment, I adjust two ‘slide-valves’ (one at each outlet) of fire-brick or fire-slab evenly ground against the outlet facings, dovetailed into or embraced by an external iron plate indented in the body of the spur, the valves to be opened and shut at pleasure by the action of iron rods leading back through the body of the spur (one on either side) to the cupola chamber.” In order to assist in destroying the momentum, and in loosening the spur after the hole is made, a spring or buffer is placed on each side of the base of the spur.

[Printed, 4d. No drawings.]

A.D. 1860, November 19.—N° 2840.

NEWTON, WILLIAM EDWARD,—(*a communication from Louis Brandt. Provisional protection only.*)—“This invention consists of improved means of and apparatus for supplying air under pressure to the furnace or furnaces, or to the fire rooms of steam vessels by means of the paddle wheels. To this end a pipe or pipes is or are conducted from the wheel houses down to some convenient spot near the fire rooms, or to an opening under the grates of the furnaces or near the fires, so that a current of air may be forced down to the fire room or to the furnaces by the motion of the paddle wheels.”

[Printed, 3d. No drawings.]

A.D. 1860, November 26.—N° 2905.

SEILER, FREDERIC.—(*Provisional protection only.*)—“An improved apparatus applicable to ships, boats, and other navigable vessels for preventing the dangers of shipwreck at sea or in rivers, and for diminishing their draught of water.” The invention consists “in the employment of an air-tight belt or collapsible float around or partially around the submerged part of ships, boats, or other vessels, such belt or float being of any suitable material, form, and dimensions, and protected externally by a metallic gauze or meshed fabric, or by any other suitable

“ metallic fabric, such metallic fabric also serving to sustain the  
“ pressure of compressed air, which is forced into the belt or float  
“ by steam power in the case of steam vessels, and by manual  
“ power in the case of sailing vessels, or otherwise. By inflating  
“ this belt or float, the displacement of the ship, boat, or other  
“ vessel, will be increased, and its draught of water consequently  
“ reduced, “ so as to enable it to float off rocks in cases of danger,  
“ and to enter harbours and other water spaces which would be  
“ otherwise inaccessible to it. By suitably placing the belt or  
“ float the stability and consequent safety of the ship, boat, or  
“ other vessel will likewise be increased in some circumstances of  
“ danger. The belt or float is formed with numerous compart-  
“ ments, and may be made removable, being drawn into and out  
“ of its position by means of ropes passing round pulleys and  
“ extending to the opposite sides of the vessel, and attached,  
“ when in place, either to fixed bolts or to screw bolts, which may  
“ be taken out of the bottom at pleasure.”

[Printed, 3d. No drawings.]

A.D. 1860, November 28.—No 2922.

**REEVES, JOHN.**—(*Provisional protection only.*)—This invention consists “ in so constructing the hulls of ships generally as to  
“ render them more secure and prevent any evil effect through  
“ straining when in a heavy or rough sea. I propose placing  
“ stays or braces across the ship’s hull diagonally from the top  
“ sides of the ship down to the bottom, said stays or braces  
“ crossing each other, and may be either of timber secured by  
“ plates and bolts, or of iron; in which case they may be fitted  
“ with turnbuckles, so as to tighten or slacken the braces as may  
“ be required. In steam vessels I propose placing a pair of the  
“ before-mentioned stays or braces close to the bulkhead of  
“ the engine room, and another pair close to the bulkhead of the  
“ boilers; between the boilers and engines should be set out or  
“ more pairs of the said stays, and which, if made of iron and  
“ fitted with turnbuckles, can be removed and replaced at  
“ pleasure. In sailing vessels two pairs of the wooden braces  
“ ought to be placed as near as practicable to the berths of the  
“ fore and main masts, and others in such places as the build of  
“ the vessel may render necessary.”

[Printed, 3d. No drawings.]

A.D. 1860, December 5.—N° 2981.

**HART, GEORGE WILLIAM.**—"This invention has for its object  
" improvements in the embrasures of fortifications and in the  
" port-holes of ships of war."

" For these purposes, in constructing the embrasures of forti-  
" fications, in place of constructing the openings in the form and  
" of the dimensions heretofore necessary in order to work the  
" guns, the openings are made of a circular form, into each of  
" which is introduced either an entire sphere or such part of a  
" sphere as will be sufficient for the purpose, such sphere or part  
" thereof being arranged to move freely within the circular  
" opening formed in the structure of the fortification in such  
" manner as to produce a ball-and-socket joint."

In "the port-holes of ships of war, in lieu of the ball and  
" socket construct the embrasure or port-hole in the shape of a  
" cylinder placed horizontally in such way that whilst the gun  
" can be trained right and left through the aperture in the cylinder  
" in the usual manner, the cylinder, by being rotated, will admit  
" of the gun being elevated or depressed. In carrying out this  
" part of my invention I mount a cylinder in the embrasure or  
" port-hole in the shield of a gun, which is arranged to rotate  
" with its carriage about a centre." The cylinder has short necks  
or axes at its ends, which turn in suitable bearings, carried by  
the framing of the shield, which is mounted on a turn-table.  
This arrangement is suitable for land and floating fortifications,  
and for the deck guns of gun-boats and other vessels.

" Again, I use a disc or portions of a disc of sufficient thickness to  
" withstand shot, and this disc has an "aperture" through which  
" the gun is fired; and when the gun requires to be elevated or  
" depressed the disc is rotated so as to permit of such elevation  
" or depression, and also when the gun is withdrawn, by rotation  
" of the disc, the port or embrasure can be entirely closed. I  
" sometimes attach to the part of the disc which revolves over  
" the port or embrasure a slide, which moves between the sides  
" or cheeks of the embrasure or port, so that by the partial  
" rotation of the disc this piece is moved so as to permit of the  
" gun being fired through an aperture in it when elevated or  
" depressed, or can be so placed as to totally close the port or  
" embrasure. By these means I obtain a revolving or sliding

" shutter to the port or embrasure, which I put in motion by  
" suitable mechanism "

In place of the ball and socket, or the cylinder arrangement,  
" I sometimes employ an arrangement of shutters or sliding  
" shields." This consists of two plates of iron lying upon and  
moving over each other; one pivoted in the ships' side before or  
abaft the port, and the other above the port. Each of these  
plates has a long and narrow aperture, the breadth of which is  
just sufficient to allow the gun to pass through. These apertures  
being placed at right angles to each other, show only a small  
quadrilateral opening into the ship, which shifts its position for  
training and elevating, or depressing the gun, by the rotation of  
the plates.

[Printed, 10d. Drawings.]

A.D. 1860, December 5.--N<sup>o</sup> 2984.

**HALLETT, GEORGE.**—This invention has for its object im-  
provements " in coating iron and other ships' bottoms and other  
" surfaces. For these purposes native oxide of antimony is em-  
" ployed, which is reduced into a powder, the matrix or impurities  
" being separated therefrom by picking and washing. The  
" powdered native oxide of antimony is then ground with a  
" suitable oil or varnish or material to admit of its being used  
" as a paint, and when desired other materials may be combined  
" with the native oxide in preparing a paint suitable for the  
" coating of iron and other ships' bottoms and other surfaces."

[Printed, 3d. No drawings.]

A.D. 1860, December 6 —N<sup>o</sup> 2989.

**JORDAN, HENRY.**—" Improvements in the construction of ships  
" or other vessels." The invention consists, " firstly, in con-  
" structing ships or vessels in which the frame is to be formed of  
" wood and iron in combination, the lower part of the longitudi-  
" nal framing being of timber up to the bulge, and the remainder  
" thereof of longitudinal angle iron frames up to the gunwale;  
" the whole of the beams being of iron, diagonal straps may be  
" introduced outside the frame from the gunwale to the lower  
" part of the bulge to take the necessary bolts for connecting the  
" timber and iron longitudinal frames together, the said straps

“ being rivetted to each angle iron frame, and bolted to each  
“ wooden frame, or in lieu of the said diagonal iron straps, an  
“ iron girder forming a segment of a circle from the rounding  
“ of the quarter up to the rounding of the bow, and down to  
“ the upper side of the bilge, may be secured in like manner to  
“ the horizontal frame, or if necessary, the said iron straps and  
“ iron girder may both be employed.

“ Secondly, in constructing wooden ships or vessels as  
“ mentioned and referred to in a Patent granted to me on the  
“ 20th day of November 1858, I prefer to employ an inner keel  
“ to which the stem, stern post, and dead woods are attached in  
“ all cases in which it is desirable not to carry up the midfeather;  
“ the longitudinal frame may then be commenced, placed about  
“ two-thirds the size of the timbers apart, chocked under every  
“ beam from keel to gunwales, and bolted to each other fore and  
“ aft up to the gunwales, the floors being placed transversely  
“ on the top of the horizontal frames inside for two thirds the  
“ length of the vessel in midships, or thereabouts, being about  
“ one floor under each beam in midships; I then place an entire  
“ iron frame in the shape of iron knees inside, one under every  
“ beam in the lower hold, and staple knees in the between decks,  
“ the lower knee taking the floor with at least three or four bolts  
“ in each knee through the floors and horizontal frames; by  
“ this plan the ship is hooped inside in the wake of every floor,  
“ or in place thereof iron straps may be introduced either diago-  
“ nally or vertically clear of the beams; a chock being caused to  
“ go between every floor to make a solid bed for the keelson,  
“ which may be either of iron ” or wood, “ and the keel put on  
“ after the ship is caulked on the principle of a false keel; either  
“ of the above descriptions of ship is to be planked with timber,  
“ either vertically in one or two thicknesses, or diagonally in two  
“ thicknesses, or vertically in midships, and radiating forward  
“ and aft to an angle of forty-five degrees, in either one or two  
“ thicknesses of planking.

“ And, thirdly, in constructing iron ships or vessels on the  
“ above principle floor plates (of sufficient size and strength  
“ to suit the tonnage) are to be run across the ship when necessary  
“ and rivetted to the midfeather in midships, which may stop at  
“ the top of the floor plates, and be rivetted to the reverse longi-  
“ tudinal frames; angle irons may be run longitudinally in the

“ centre of the plates overlapping the centre of the butt of every  
 “ plate, fore and aft, or may stop at forward and after bulkheads  
 “ or thereabouts. In introducing the transverse water-tight bulk-  
 “ heads to any of the above descriptions of vessel, I turn or  
 “ bend two angle irons back to back round the inside in wake of  
 “ every bulkhead rivetted to the reverse frame to receive the bulk-  
 “ heads in between them, and to be rivetted through the two flanges.  
 “ In order to render these bulkheads water-tight, wooden chocks  
 “ are to be driven firmly between the longitudinal frames, and  
 “ secured with wood screw bolts to the transverse frame.”

[Printed, 10d. Drawings.]

A.D. 1860, December 8.—N° 3011.

**ROBERTS, THOMAS.**—“ This invention has for its object com-  
 “ bining great strength and durability in the construction of  
 “ ships and floating batteries, and rendering them capable of  
 “ resisting the action of shot, shell, or other missiles ”

The main ribs of the vessel are to be composed of wrought iron; they may be rolled in the form of a girder, with an outer and inner flange, or formed of plate and angle iron rivetted together in the usual manner. To the main ribs are rivetted horizontal T-plates of wrought iron or steel, of about one quarter of an inch in thickness, and between these T-plates are placed timber baulks or planks, about nine inches square, which planks are bolted to the main ribs, and the joints between the said T-plates and timber planks, are well caulked with oakum or other suitable material. The planking will be sheathed with copper under the water line in the usual manner.

In order to give the sides of the ship above water additional strength, to resist the effect of shot and concentrated broadsides, they are made of double thickness, from about 5 feet under the load water line to the bulwarks. This extra thickness is made by placing against the aforesaid horizontal timber planking, vertical T-plates, composed of wrought iron or steel, of about a quarter of an inch in thickness; and between these T-plates are placed vertical timber baulks or planks, about nine inches square, all the joints between the said vertical timber planks and vertical T-plates are then to be well caulked. The vertical timber planks are bolted to the horizontal timber planks, by which means the horizontal and vertical layers of timber planking and

iron T-plates are firmly bound together, and thereby form the side of the ship or floating battery.

In order to prevent shot, shell, or other missiles from penetrating the ship's side, I cover the outsides of the vessel to a depth of about five feet below the load water line, with wrought iron armour plates, about two feet wide, and about three inches thick. The said armour plates are intended to be bent, rolled, or hammered into an angulated form, in order that no part of their surface shall present a flat face, or surface at right angles to the direction of the shot or other missiles. The armour plates are to be made of suitable lengths, and their horizontal and vertical edges are to be planed, so that at their joints they may fit close and tight together. The armour plates are fastened to the ship's side at the horizontal joints by bolts, and in order to form a bed for the plates, the edges of the vertical iron T-plates, and the surface of the timber between, are so cut as to form a serrated surface. To protect the horizontal joints of the armour plates and the bolts fastening them to the ship's side, they are covered with wrought-iron joint ribs, about six inches wide and four and a half inches deep, the outside of each presenting an angular face to the direction of the shot or missiles, and the insides fitting recesses formed by cutting each side of the joints of the armour plates. In the recesses between each joint rib and the armour plates is placed a layer of sheet lead or copper, of about one-eighth of an inch in thickness, in order to deaden the force of the shot or other missiles by which the joint rib may be struck. The joint ribs are fastened to the ship's side by wrought-iron bolts. The angular edges of the armour plates and the joint ribs are formed of steel to split the shot.

“ In the Provisional Specification it was stated that the keel  
“ of the vessel was to be constructed in the form of a hollow  
“ cylinder composed of plates of iron, rivetted or otherwise fas-  
“ tened together, and also that in the spaces between the main  
“ ribs were placed springs and packings of cork, hemp, oakum,  
“ wool, or other soft yielding substance, saturated with water-  
“ proof and fireproof preparations, but these and other unim-  
“ portant details I have now abandoned, and therefore disclaim  
“ the use of them.”

A.D. 1860, December 12.—N<sup>o</sup> 3052.CORNISH, SAMUEL TOM.—*Provisional protection only.*—

“Improvements in the construction of ships for the purpose of rendering them shot and shell proof.” “I arrange the metal in the form of a series of ribs of the ship, which may vary in thickness as may be best adapted for the purpose, say about one and a half or two inches. These pieces of metal should be about nine or ten inches in width; they are presented edgewise to resist the shot, and are alternated with timbers or other material of about the same thickness as the metal, the whole being strongly bolted or clamped together to form a solid mass. I then place a lining of plank, or it may be metal plates inside and outside of this compound iron and wood framework, and bind the whole suitably together. Iron forming part of the framework of the ship as described adds greatly to its strength, unlike outside shot-proof plates, which encumber and rather detract from than add strength to the framing of the ships. The shot-proof ribs before mentioned should be thinned at a sufficient depth below the water line, and as they approach the keel some may even terminate at a point not requiring protection from shot, the deficiency being made up with wood. The decks of ships may also be similarly constructed.”

[Printed, 3d No drawings.]

A.D. 1860, December 14.—N<sup>o</sup> 3081.BATCHELOR, HENRY.—*(Provisional protection only)*—“Im-

“provements in the construction and manufacture of models of ships, boats, or other vessels.” In order to construct the model of a boat or other vessel according to the first part “of my invention, I first take a sheet of cardboard or other suitable material,” and draw or print on one side thereof the several lines which, when the model is made up, will represent the various lines of the interior of the vessel, and in like manner “I draw, print, or color the other side of the said sheet with suitable lines and surfaces to represent the water line, bottom, or other parts of the exterior surface of the boat or other vessel when made up, and portions of the surfaces may be embossed with lines or ornaments if desired. The printed or colored card thus prepared is next to be cut or punched out at

“ each end to form the bow and stern, and suitable incisions or  
“ slits are also made in the sides so as to facilitate the shaping of  
“ the model of the boat or vessel upon the block or form upon  
“ which the model is made up. This block or form may consist  
“ of a piece of wood or other material, or a casting in metal,  
“ plaster of Paris or other cement may be employed formed or  
“ modelled to the same shape as the interior surface of the model  
“ boat or vessel it is intended to make up or manufacture thereon.  
“ To this block or mould the sheet of cardboard or other ma-  
“ terial previously prepared as described is applied so as to fit  
“ the block, to which it is attached in any convenient manner,  
“ and the joinings of the bow, stern, or other parts may be ac-  
“ complished by sewing or cementing together, and in some cases  
“ it may be desirable to shape the model of the boat or vessel by  
“ pressure in a hollow mould of corresponding form to the block  
“ above described. When the model is thus far prepared, and  
“ the parts are firmly united, strips of cardboard or other ma-  
“ terial to represent strakes of plank are applied to the interior  
“ and exterior surfaces, and secured thereto by sewing, by marine  
“ glue, or by other means.” “The fore parts, the stern, and  
“ other projecting or ornamental parts of such models may be  
“ formed by moulding them in suitable moulds from paper pulp,  
“ cement, or other compcunds, or by embossing processes.”

In place of constructing the models of boats from a sheet of paper, cardboard, or other material, they may be made up of “ a  
“ number of strips of paper, fabric, or other suitable material  
“ laid in diagonal and vertical lines over the surface of a block  
“ or mould, and pasted or cemented together until of sufficient  
“ substance to form the shell or hull of a model boat or vessel  
“ upon which the ribs, planks, or other parts may be affixed in  
“ any convenient manner, or the shells or hulls of such model  
“ boats or vessels may be constructed by coating the surface of  
“ the block or mould with india-rubber solution or other ad-  
“ hesive materials, and then laying fabrics or fibrous material  
“ thereon, or sifting flock or other substance in powder over it,  
“ then drying so as to be able to remove the shell from the block  
“ or mould, and finishing the same by hand.”

“ Another part of my improvements in constructing ” “ models  
“ of boats or other vessels consists in forming the various parts  
“ in separate pieces so as to be capable of being put together and

" united by cement, or otherwise to form a complete model, in  
 " order to afford instruction to young persons or others in the  
 " art of ship or boat building; and I prefer to form the several  
 " parts of such models by similar means to those previously de-  
 " scribed, wire being inserted into some of the parts."

[Printed, 3d. No drawings.]

A.D. 1860, December 15.—N° 3084.

DAVIES, GEORGE,—(*a communication from Richard Mont-  
 gomery.*)—"Improvements in building bridges, ships, or other  
 " structures of iron or other metal."

The invention consists, firstly, "in the use or application of  
 " peculiarly constructed metal beams for such purposes, such  
 " beams being formed or constructed according to an invention  
 " for which I have obtained Her Majesty's Letters Patent, dated  
 " 15th December 1860, N° 3086;" and, secondly, "in certain  
 " details of construction consequent upon and rendered ne-  
 " cessary by the employment of such beams for constructive  
 " purposes."

"In constructing ships according to this invention, the ribs or  
 " framework, deck beams, and other fundamental parts of the  
 " hull of the vessel are " constructed of corrugated metal beams,  
 " made according to the invention above named, the flanges of  
 " such beams forming the necessary margins by and to which  
 " the outer planking or plates and deck planking are fastened.  
 " The knee joints by which the deck beams are fastened to the  
 " ribs or outer framing may be made of cast iron, and must be  
 " formed with projections to interlock with the corrugations of  
 " the beams. At those parts of the beams where bolts pass  
 " through, filling pieces of wood or metal are to be employed to  
 " strengthen and stiffen the corrugated metal. The bottom of  
 " the hull may be supported and strengthened if desired by  
 " means of a longitudinal corrugated iron beam or keel. The  
 " entire hull may be divided transversely into separate water-  
 " tight compartments by means of vertical corrugated metal  
 " plates, the edges of which being fitted into the corrugations of  
 " the beams and properly caulked require no rivets or other means  
 " of fastening."

[Printed 2s. 4d. Drawings.]

A.D. 1860, December 15.—Nº 3086.

DAVIES, GEORGE, — (*a communication from Richard Montgomery.*)—"Improvements in the construction of iron or other metal beams, and in the machinery or apparatus employed for such purpose." The invention has reference to a peculiar form or construction of iron or other metal beam, "for which Letters Patent were granted to the said Richard Montgomery, bearing date the 24th day of March 1854, Nº 690, in which the novelty consisted principally in forming a beam of plate or sheet metal of uniform thickness, bent or formed into a series of longitudinal folds or corrugations, the sides of which are flat and parallel, and the tops and bottoms 'inverted and uninverted arches.' Now the said inventor has discovered that beams so constructed (of the same weight) are much stronger when made so that one or both series of the arches shall be thicker than the straight or parallel portions of the said beams. The first part of this invention therefore consists in constructing such beams with the arched portions thicker than the parallel parts of the same, for the purpose of imparting additional strength without increased weight, whether such beams be rolled from plate or sheet metal, as described in the specification before alluded to, or directly from a 'bloom' or rectangular bar of metal."

"The second part of this invention consists of a method of and apparatus for rolling such beams at one heat directly from a 'bloom' or rectangular bar of metal, without the necessity for previously rolling it into a plate or sheet, whereby a great economy in both fuel and labor is effected. The apparatus for effecting this object consists principally of two or more rolls, placed one above the other (three being preferred), mounted in a suitable framing and geared together. These rolls are furnished with several indentations or grooves, so arranged that the bar in passing successively through them is gradually worked from a rectangular shape to a form somewhat resembling (in cross section) the letter M, the flanges and inverted arch at the bottom, and the two uninverted arches at the top, being thicker than the sloping sides. From the last of these grooves the beam passes directly into and through a former or die, the mouth of which is 'flared,' and has its sides

“ slightly sloping, to correspond with the form of the beam as  
“ delivered from the rolls. The interior of this former or die is  
“ contracted, and its sides gradually assume a vertical position,  
“ so that the beam on passing through is delivered on the other  
“ side, with its four straight portions or sides vertical and  
“ parallel, having at the bottom two exterior horizontal flanges,  
“ and being connected together at the bottom and top by one  
“ inverted and two uninverted arches, which, together with the  
“ flanges, are thicker than the vertical sides or portions thereof.”  
If the beam require to be arched, it can be effected by the use of  
a sweeping or curving roll, suitably adjusted.

[Printed, 10d. Drawings.]

A.D. 1860, December 17. N<sup>o</sup> 3102.

MOREL, ERNEST LEON — *Provisional protection only.*) — “ Im-  
“ provements in ships’ rudders, and the mode of mounting or  
“ applying the same to the stern posts of vessels.”

This invention relates to a novel mode of constructing temporary rudders, which are intended to be used in emergencies, when the permanent or regular rudder has been broken, damaged, disabled, or lost by accident; and also to the means of mounting or attaching these temporary rudders to the stern post of the vessel.

“ The temporary rudder is (for the convenience of storage  
“ when not required for use) constructed in sections, and may be  
“ composed either of wood or sheet iron, and is provided with  
“ eye bolts, through which may be passed a strong iron rod, bar,  
“ or shaft, on which the temporary rudder works or turns as an  
“ axle. The sections of which the temporary rudder is composed  
“ are constructed in such a manner with iron clamps or otherwise  
“ that any desired number of them may be connected together  
“ by means of screw bolts or screws. In order to facilitate the  
“ mounting of the temporary rudder, a horizontal hole is made  
“ through the stern post at some convenient point below the  
“ the water line, and through the hole is passed a chain or rope,  
“ both ends of which are secured on deck. When the ordinary  
“ rudder is lost, damaged, or materially injured, the sections of  
“ the temporary rudder must be connected together, and the  
“ rudder must be lowered into the water by means of a chain  
“ secured to the upper part of the rudder spindle or axle, the

“ lower end of which is secured to one of the ends of the rope  
“ or chain that is passed through the hole in the stern post. By  
“ hauling on the other end of the rope or chain the lower part of  
“ the rudder spindle will be brought against the horizontal hole  
“ in the stern post, and by securing the rope on deck the rudder  
“ may be held fast at its lower end. The upper end of the  
“ spindle is let into and works in an eye or socket fixed in the  
“ stern post for the purpose, so that the rudder spindle will have  
“ two fixed points to turn upon. In order to work the rudder  
“ two ropes are secured to it, one on each side, and near to the  
“ outer edge, and these ropes being passed through pullies  
“ secured at the ends of a cross-tree or spar projecting over both  
“ sides of the vessel, and the ends of the ropes being brought on  
“ to the deck, the rudder may be manœuvred with facility.”

[Printed, 8d. No drawings.]

A.D. 1860, December 20.—N<sup>o</sup> 3132.

RENNIE, GEORGE BANKS.—“ Improvements in machinery, ap-  
“ paratus, and works of construction, intended to be employed,”  
and the mode or method of using or employing the same, for  
“ the purpose of examining or repairing ships and other vessels.”  
Upon the floor of a floating dock or pontoon of suitable con-  
struction “ I place and securely fix two or more edge rails, tram-  
“ ways or tramplates of any convenient form, and for the purpose  
“ of supporting and guiding a multi-wheeled or other carriage,  
“ or bed upon which the ship or other vessel has to be drawn,  
“ when the pontoon or dock is sufficiently submerged, and upon  
“ which it has to be securely blocked, shored, strutted, or stayed,  
“ so as to admit the carriage, together with the ship or other  
“ vessel thereupon, being afterwards moved or hauled off from  
“ the pontoon or floating dock. Instead of a wheeled carriage  
“ it may be sledge-like in character, and the friction wheels may  
“ be mounted on the floating pontoon or dock, and in lines upon  
“ the wharf or quay ; but whatever the form of the carriage may  
“ be, it should be placed in position and properly secured within  
“ the floating dock previously to its being submerged for the  
“ purpose of receiving the ship or other vessel.

“ Upon a wharf or quay at a suitable height from a constant  
“ water level, or from a bed line or foundation suitably prepared .  
“ to receive the pontoon or floating dock, a corresponding series

“ of edge rails or tram plates are provided, of which several sets  
“ may be arranged parallel to each other at a sufficient distance  
“ apart to enable sufficient access to be given; or they may be  
“ arranged radially, or radiating from a common centre at some  
“ distance ' from the sea or river face of the wall. “The level  
“ of the two lines or sets of rails upon the floating pontoon or  
“ dock and the wharf or quay respectively must correspond, or  
“ be in line and upon the same level, for the purpose of enabling  
“ the carriage containing the ship or other vessel to be readily  
“ drawn off with the least possible power, and without the risk  
“ of straining the ship, or displacing it from the carriage.

When it is necessary “ I enclose a portion of the water space,  
“ or excavate or otherwise form a shallow basin, which need only  
“ be of sufficient depth to admit freely the pontoon or floating  
“ dock carrying the vessel. The bottom of this shallow basin or  
“ float must be constructed with a level bed, so that when the  
“ pontoon or dock is floated in, and the caisson or gates closing  
“ the entrance thereof have been replaced, the pontoon or float-  
“ ing dock is allowed to sink on to the level bed prepared for it;  
“ the rails of the floating dock are then brought in correct  
“ position with those on shore, and the carriage upon which the  
“ ship or other vessel is placed is moved or slid gradually from  
“ off the floating dock or pontoon, and along the rails or tram-  
“ ways on shore, until it is advanced into the required position.  
“ The floating dock or pontoon is then free to be undocked or  
“ floated out to receive another ship or other vessel, the previous  
“ carriage having been replaced by another, or the dock or pon-  
“ toon is then ready to receive a vessel which has been previously  
“ raised, placed on shore and repaired, that it may again be set  
“ afloat.”

“ For the purpose of closing the entrance of such basins or  
“ floats, and likewise for closing the entrance to docks and basins  
“ generally, in substitution for the ordinary ship-like form of  
“ caisson, or for gates, I construct a novel form of caisson, by  
“ forming a hollow framed or cellular structure of a form or  
“ elevation suitable for closing the opening, and fitting into the  
“ grooves formed in the cell and side walls. I give to the thick-  
“ ness or sectional plan of such caisson a parabolic or other  
“ strong form or shape, capable of resisting the pressure due to  
“ the greatest pressure of water behind it, and I attain this with

“ the smallest thickness and least weight of material; and in-  
“ stead of depending upon the buoyancy of the lower portion of  
“ such structures, as is usually the case, I form on each side, and  
“ at the top or upper part of such structure, a hollow float or  
“ half boat-shaped hollow buoyant vessel; and I fit both the  
“ upper and lower portions of such caisson with sluices and  
“ valves for the admission and discharge of water. The float or  
“ floats being of sufficient capacity, when the water is allowed to  
“ escape, or otherwise removed therefrom, the caisson may then  
“ be released from its position and floated away. In this respect  
“ the caisson constructed according to my present invention is  
“ more easily managed, and greater stability is obtained, and the  
“ amount of material, and the cost of making such structures is  
“ very materially reduced.

“ For the purpose of giving a continuous or nearly continuous  
“ motion to the carriage with its superimposed ship, I combine  
“ hydraulic pumps or rams of great power in a novel manner;  
“ and I apply such apparatus in combination with a portable  
“ steam engine mounted upon a strong carriage running upon  
“ the same or other rails as those provided upon the shore for  
“ receiving the carriage carrying the ship; and by means of one  
“ or more sets of single or double racks and palls mounted upon  
“ or depending from the portable carriage or framing containing  
“ the steam engine and hydraulic apparatus (which palls are  
“ made to take into and resist the power exerted by the hydraulic  
“ pumps or rams whilst pulling or pushing,) I am enabled to  
“ maintain a nearly uniform thrust or strain, and a continuous or  
“ nearly continuous and uniform motion of the carriage in either  
“ direction, by the admission of water alternately from one pump  
“ to others, or from one set of pumps to another pump or pumps,  
“ of areas correspondingly proportioned to one another to give  
“ out a uniform amount of power in whichever direction motion  
“ may be required; and thus, without reversing the portable or  
“ locomotive engine and hydraulic apparatus, I am enabled either  
“ to exert a thrust or a tractive power, as may be required for the  
“ purpose of hauling on to the land, or pushing off from the land  
“ on to the floating pontoon or dock, the carriage containing the  
“ ship or other vessel.”

Although the wheeled carriage for receiving the vessel to be docked, has been referred to as being secured within the floating dock, previously to such dock being submerged, “ I may prefer in

“ some cases to proceed somewhat differently, and as follows :—  
“ The ship or other vessel to be docked may, as a preliminary  
“ operation, be allowed in the first instance to be deposited upon  
“ keel blocks upon the floor of the floating pontoon or dock.”  
“ The wheeled carriage may then be introduced under the keel  
“ of the ship, the keel blocks being gradually removed from  
“ thereunder, and the carriage slid in, so that the vessel may be  
“ hauled off the blocks, and, by means of the multi-wheeled  
“ carriage herein-before described, be received from the floor of  
“ the floating pontoon or dock, and placed in any position on  
“ shore for the purpose of examination or repair. In some cases  
“ it may be desirable to receive the vessel upon the carriage or  
“ cradle contained within the floating dock or pontoon direct, and  
“ by means of shores in the ordinary way secure the vessel within  
“ and to the sides of the dock until the dock and vessel have been  
“ raised, when, if found necessary, the proper and necessary block-  
“ ings and means of securing the ship to the carriage may be  
“ proceeded with.”

[Printed, 1s. 3d. Drawings.]

A.D. 1860, December 28.—N<sup>o</sup> 3184.

RUSSELL, JOHN SCOTT. “ This invention has for its object  
“ improvements in constructing and arming ships and vessels,  
“ and also floating and land batteries. For these purposes, in  
“ constructing the sides of ships, vessels, or batteries, they are  
“ constructed double with an inner and outer skin or plating,  
“ and the space between the two skins is divided by longitudinal  
“ and upright partitions, or by longitudinal partitions only, or  
“ upright partitions only, as may be required, which connect the  
“ two skins and produce numerous cells. Suitable angle or other  
“ iron is used in the structure, as is now well understood in iron  
“ shipbuilding. Into each of these cells which come near to or  
“ are above the line of floatation of a ship or floating battery, or  
“ which in a land battery is desired to be rendered more or less  
“ strong to resist shell and shot, a thick protecting plate of iron, in  
“ size suitable to fit into the cell, is introduced, and it is preferred  
“ that its outer surface should come flush against the inner surface  
“ of the outer skin or plating, and where necessary, such inner  
“ surface of the outer skin or plating is made flush by plates

“ corresponding in thickness with the plating or angle iron used  
“ therewith. Or the space between the inner surface of the outer  
“ skin or plating may be otherwise filled in between it and the  
“ outer surface of the thick protecting plate introduced into the  
“ cell. The space between the inner surface of the thick pro-  
“ tecting plate, and the outer surface of the inner skin or plating,  
“ is filled with wood, so that the thick protecting plate of iron  
“ introduced into the cell will be securely retained in position  
“ without other fastenings.” Wood or other elastic filling may  
however be dispensed with, and the inner skin may be brought in  
contact with the inner surface of the protecting plate.

“ In place of using one thick plate of iron in a cell the requisite  
“ thickness and substance may be obtained by introducing two  
“ or more plates in like manner to what is above described in  
“ respect to a single protecting plate.” In this case it may be  
found desirable to have longitudinal cells only, and to arrange the  
butts of the filling plates in such a manner, that the butts of no  
two strakes in the same cell are in the same plane, technically  
called breaking the joints.

The plating of the inner and outer skin is to be “ rivetted in the  
“ ordinary manner, and if desired, there may be applied ‘through’  
“ bolts or rivets, so that the outer skin and inner skin, together  
“ with the interposed protecting plates may be all fixed together,  
“ and to the inner ribs or framing of angle iron, whether of L or  
“ T or other form. In certain cases, upright webs only are used,  
“ and the cells are then filled with bars or plates of iron placed  
“ with their edges against the inner surface of the outer skin or  
“ plating, and the outer surface of the inner skin or plating;  
“ these bars or plates may be placed close together, thus entirely  
“ filling up the cells, or there may in some cases be spaces left  
“ between the bars.” These spaces may be filled with cement,  
wood, or other substance desired, and the bars may be either  
flat or curved, of any shape or size that may enable them to add  
strength to each other, and to the general structure.

“ In some cases thick protecting plates are affixed to the outside  
“ or inside or both of the skin or plating of a ship, vessel, or  
“ battery, either by means of double-angle iron or other suitable  
“ forms of iron, which being rivetted or otherwise fixed to the  
“ skin or plating stand out therefrom at right angles to the sur-  
“ face or at any required angle, and to a sufficient extent to  
“ receive the desired thickness of protecting plate or plates, and

“ then to admit of the projecting parts of such angle or suitably  
“ formed iron being turned over and hammered, or folded down  
“ upon the thick protecting plate or plates. Thus, in using two  
“ or double angle irons back to back in this way, one will be  
“ hammered or folded over or bent in one direction to hold one  
“ edge of one thick protecting plate or plates, and the other will  
“ be hammered or bent over in the opposite direction so as to  
“ hold one edge of a neighbouring thick protecting plate or plates,  
“ the other edges of the protecting plates being held in a similar  
“ manner by other angle or other irons. Or by using a single  
“ angle iron or T-iron, the edges of the thick protecting plates  
“ being rounded or chamfered at the angle furthest from the skin  
“ or plating, that part of the angle iron or T-iron that projects  
“ beyond the thick protecting plate or plates may be hammered  
“ or rivetted down so as to hold the adjoining edges of two thick  
“ protecting plates.”

The requisite plates of iron for protecting a ship or battery from  
shell and shot, may sometimes be fixed “ by means of angle or  
“ suitably formed iron fixed to the skin or plating, the pro-  
“ jecting ribs of such angle iron being made suitable not only  
“ for receiving the desired thickness of protecting plate on either  
“ side of each of such ribs, but also to allow of the rib to pro-  
“ ject beyond the protecting plates on either side, and thus to  
“ allow of having other angle or suitably formed iron to come  
“ on either side of the rib and be rivetted or otherwise fixed  
“ thereto.”

Over a combination of protecting plates and angle iron, applied  
external of the skin, may be put another covering of thick pro-  
tecting plates, “ with the strakes in a direction at right angles  
“ with the other or inner covering of thick protecting plates.  
“ The edges of the other plates may be connected together by  
“ means of tongues and feathers formed on their edges, or by  
“ means of iron dowels,” “ and then a certain number of through-  
“ bolts used to tie the whole structure together.”

A great object in this invention is “ to avoid the injurious  
“ effects of having the protecting plates and the structure to  
“ which they are fixed perforated with numerous holes for the  
“ reception of bolts, and at the same time to prevent the weaken-  
“ ing effects to the structure and to the protecting plates con-  
“ sequent on the use of the number of large bolts heretofore  
“ necessary for fixing protecting plates, and with this object when

“ I use through bolts I employ them as sparingly as may be,  
“ having recourse to the other modes of fixing herein described.  
“ Screw bolts may be used, introduced from the interior the  
“ inner surfaces of the thick protecting plates in such cases  
“ being tapped to receive the screws ; but it is preferred that the  
“ screws when thus introduced from the interior of the structure  
“ should not pass through the protecting plates, so as to appear  
“ on the outer surface thereof.”

“ In some cases, in place of using protecting plates of con-  
“ siderable thickness, the requisite extent of mass is obtained by  
“ the system of plating resorted to, and which is accomplished  
“ by a mode of using several thicknesses of plating rivetted or  
“ bolted together, combined with a system of breaking joint,  
“ and also by reversing the direction in which the succeeding  
“ layers of plates or sheets of iron are used ; thus, supposing in  
“ one layer the length of the plates is upright, in the next layer  
“ the length of the plates is horizontal, the plates of one layer  
“ covering the joints of the plates of the next layer, and then in  
“ the following layer, though in the direction of a previous layer,  
“ the joints of the plates are arranged to come at a distance from  
“ those of the plates of the other layer, which is laid in the same  
“ direction, as well as at a distance from the layer or layers which  
“ are in a different direction, by which means the joints of no  
“ two layers of plates will come in the same position, but each  
“ layer, whether placed in the same or in a different direction,  
“ will cover and extend on either side of the joints of the other  
“ layers, and such combinations of platings may be used as only  
“ part of the means of obtaining the requisite mass, and a  
“ structure such as above described may have additional pro-  
“ tecting plates applied thereto in any convenient manner.”  
“ One advantage that I obtain by the method I adopt of using a  
“ number of plates of equal or various thicknesses to make up  
“ the total required thickness is, the facility I thereby obtain of  
“ varying the total thickness according to circumstances, and  
“ the necessity there may be of protecting more or less any part  
“ or parts, as, for instance, I may make the parts of the ship  
“ near the centre of the vessel where engines, boilers, and maga-  
“ zines are placed, of a greater thickness, and towards the ends  
“ of the vessel or wherever protection is less vital, or wherever  
“ the surfaces are more oblique to certain lines of fire, I may re-  
“ duce the thickness.”

" In arming ships or vessels, more particularly those which are  
" propelled by screws or submerged propellers, with a view to the  
" use of large pivot guns, the 'chain-wales' or projecting plat-  
" forms heretofore used for the purpose of extending the shrouds  
" are, in carrying out my invention, suitably constructed and  
" made flush with the deck of the ship or vessel, so as to be  
" armed with pivot guns and suitable pivot holes, and ways are  
" to be formed on such projecting platforms or 'chain-wales,' " or  
" on other projecting platforms constructed for the purpose, " and  
" on the deck near thereto, so that the pivot guns may be readily  
" moved into position from the deck on to such projecting plat-  
" forms, and from them to the deck, as occasion may require."  
" By such means pivot guns may with facility be fired in a direc-  
" tion fore and aft, and parallel or nearly so to the keel of a ship  
" or vessel."

Also, " in order to reduce the size of the port-holes and embra-  
" sures guns are, according to part of my improvements mounted  
" on or between two bars, on which they are capable of sliding,  
" there being india-rubber or other springs or elastic buffing  
" apparatus used to receive the shock consequent on the dis-  
" charging such a gun, and in addition to such elastic resistance  
" provision is also made to nip one of the bars more and more by  
" a nipping apparatus in order to offer increasing friction, and  
" thus to resist the backward motion of a gun, which is most  
" conveniently accomplished by an excentric or inclined surface  
" caused to bear more and more tightly on one or both of the  
" bars, and such nipping apparatus may be conveniently brought  
" into action by the gun or apparatus connected therewith, or  
" acted on as the gun is passing back in a recoil The hinder  
" ends of the two bars are connected together by a crosshead or  
" suitable connecting piece, which may be supported from above  
" or on a sledge or wheels, which may rest on a deck or a floor  
" Provision is to be made for raising and lowering the breech end  
" of the gun and the hinder ends of the two bars."

[Printed, 2s. 2d. Drawings.]

**ERRATA.**

**Page 283, *for* "McInnis, John," *read* "McInnes, John."**

**„ 309, *for* "Thomson, Nathan, Junr.," *read* "Thompson,  
Nathan, Junr."**



## APPENDIX.

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### CHRONOLOGICAL LIST OF WORKS RELATING TO SHIP-BUILDING, ETC.

A.D.

1697. Paul Hoste. *Théorie de la Construction des Vaisseaux, qui contient Plusieurs Traitez de Mathématique sur des Matières nouvelles et curieuses.* 1697.
1714. John Bernouilli. *Essai d'une Nouvelle Théorie de la Manœuvre des Vaisseaux.* 1714.
1717. William Sutherland. *Britain's Glory; or Shipbuilding unvailed.* London, 1717.
1721. William Sutherland. *The Shipbuilder's Assistant; or some Essays towards completing the Art of marine Architecture.* London, 1721.
1727. Paul Hoste. *L'Art des Armées Navales, ou Traité des Évolutions Navales.* Lyon, 1727.
1746. M. Bouguer. *Traité du Navire, de sa Construction, et de ses Mouvemens.* Paris, 1746.
1754. Mungo Murray. *A Treatise on Shipbuilding and Navigation. Illustrated with 18 Plates.* London, 1754.
1757. Daniel Bernouilli. *Principes Hydrostatiques et Mécaniques, ou Mémoire sur la Manière de diminuer le Roulis et le Tangage d'un Navire, sans qu'il perde sensiblement par cette diminution, aucune des bonnes qualités que sa construction doit lui donner.* Paris, 1757.
1758. M. Duhamel du Monceau. *Elémens de l'Architecture Navale, ou Traité Pratique de la Construction des Vaisseaux.* Paris, 1758.
1759. Léonard Euler. *Recherches sur le Roulis et le Tangage des Vaisseaux.* 1759.

A.D.

1768. Friderico Henr. Chapman S. R. Majest. Naupego, R. Acad. Scient. Svec. Membro. *Architectura Navalis Mercatoria, Navium varii generis mercatoriarum, capulicarum, cursoriarum, aliarumque, cujuscunque conditionis vel molis, formas et rationes exhibens: exemplis æri incis, demonstrationibus denique, dimensionibus calculisque accuratissimis illustrata.* Text in Swedish. Stockholm, 1768.

N.B. This work, which has an Atlas of 62 exceedingly large and valuable plates, is very rare. It is believed that there are not more than one or two copies of the Atlas in England; one of these is in the possession of Mr. John Scott Russell.

1773. Léonard Euler. *Théorie complète de la Construction, et de la Manœuvre des Vaisseaux.* 1773.
1781. Vial du Clairbois. *Traité de la Construction des Vaisseaux, avec des éclaircissemens et démonstrations touchant l'ouvrage intitulé Architectura Navalis Mercatoria, &c.* Brest, 1781.
1781. Marmaduke Stalkartt. *Naval Architecture; or, the Rudiments and Rules of Shipbuilding, exemplified in a Series of Draughts and Plans, with Observations tending to the further improvement of that important Art.* London, 1781.
1783. Don Georges Juan. *Examen Maritime, Théorique et Pratique, ou Traité de Méchanique, appliqué a la Construction et a la Manœuvre des Vaisseaux et autres Bâtimens.* Traduit de l'Espagnol, avec des additions, par M. Levesque. Nantes, 1783.
1787. Romme. *L'Art de la Marine, ou Principes et Préceptes Généraux de l'Art de construire, d'armer, de manœuvrer, et de conduire des Vaisseaux.* Rochelle, 1787.
- 1789 William Falconer. *A Universal Dictionary of the Marine; or, a copious Explanation of the Technical Terms and Phrases employed in the Construction, Equipment, Furniture, Machinery, Movements, and Military Operations of a Ship.* London, 1789.

A.D.

1790. Léonard Euler. A complete Theory of the Construction and Properties of Vessels, with practical Conclusions for the Management of Ships, made easy to Navigators. By Henry Watson, from the French. London, 1790.
1796. George Attwood, Esq., F.R.S. On the Statical Stability of Ships and other floating Bodies.  
Transactions of the Royal Society. 1796 and 1798.
1801. John Charnock, Esq., F.S.A. History of Marine Architecture. London, 1801.
1805. Vial du Clairbois. *Traité Élémentaire de la Construction des Bâtimens de Mer.* Paris, 1805.
1816. R. Seppings, one of the Surveyors of H. M. Navy. Directions to be observed in Building and Re-building Ships of the Line, fifty-gun Ships on two Decks, and Frigates, according to a New System of Construction. London, 1816.
1820. Rev. James Inman, D.D. A Treatise on Shipbuilding with Explanations and Demonstrations respecting the *Architectura Navalis Mercatoria*. Translated into English with explanatory notes, and a few remarks on the Construction of Ships of War, from the French. Cambridge, 1820.
1822. John Knowles, F.R.S., formerly Secretary to the Admiralty. The Elements and Practice of Naval Architecture; or a Treatise on Shipbuilding, theoretical and practical. Also the Principles and Practice of constructing the Royal and Mercantile Navies, as invented and introduced by Sir Robert Seppings, Surveyor to the Navy. With copious tables and a large volume of plates. London, 1822.
1822. H. J. Paixhans. *Nouvelle Force Maritime, et Application de cette Force a quelques Parties du Service de l'Armée de Terre; ou Essai sur l'Etat actuel des Moyens de la Force Maritime; sur une Espèce nouvelle d'Artillerie de Mer, qui détruirait promptement les Vaisseaux de haut-bord; sur la Construction de Navires a Voile et a Vapeur, de grandeur modérée, qui, armés de cette Artillerie, donnerait une Marine moins couteuse et plus puissante que celles existantes.* Paris, 1822.

A.D.

1822. Baron Dupin. *Mémoire de la Stabilité des Corps Flot-  
tants.* 1822.
1826. Papers on Naval Architecture and other Subjects connected  
with Naval Science, conducted by William Morgan and  
Augustin Creuze, Naval Architects, formerly Students at  
the School of Naval Architecture, Portsmouth. London,  
1826 to 1831.
1830. William Burney, LL.D. *New and universal Dictionary of  
the Marine.* Illustrated with a variety of modern Design  
of Shipping, &c., together with separate Views of the  
Masts, Yards, Sails, and Rigging, &c. Originally compiled  
by William Falconer, Author of the *Shipwreck*, &c., now  
modernized and much enlarged. London, 1830.
1832. John Edye, Assistant Surveyor of the Royal Navy. *On the  
Equipment and Displacement of Ships of War.* London,  
1832.
1834. Colonel Mark Beaufoy, F.R.S., &c. *Nautical and Hy-  
draulic Experiments, with numerous scientific Miscella-  
nies.* London, 1834.
1836. Isaac Blackburn. *The Theory and Science of Naval Archi-  
tecture.* Plymouth, 1836.
1840. A. Jal, Chevalier de la Légion d'Honneur, Historiographe  
de la Marine, Ministère de l'Instruction Publique,  
&c. *Archéologie Navale.* 2 vols. Royal 8vo. £1 18s.  
Paris, 1840.
1841. R. H. Dana. *The Seaman's Manual, containing a Treatise  
on Practical Seamanship, Dictionary of Sea Terms, &c.*  
12mo. With Plates. 4s. 6d. Trübner, London, 1841.
1842. M. Campagnac. *De l'Etat actuel de la Navigation par a  
Vapeur.* 26 francs. Paris, 1842.
1843. J. Scott Russell, F.R.S. *The Wave-line Theory, and the  
Forms and Dimensions of Ships.* Reports of the British  
Association. 1843 et seq.
1845. Ad. D'Étroyat. *Traité élémentaire d'Architecture Navale.*  
10 francs. L'Orient, 1845.

A.D.

- 1847 and 1848. MM. le Baron de Bonnefoux et Paris, Capitaines de vaisseau. Dictionnaire de Marine à Voiles, et à Vapeur. 2 vols. and Atlas £2. Paris, 1847 and 1848.
1849. Rev. James Inman, D.D. Formulæ and Rules for making Calculations on Plans of Ships, with an Example of their Application. 3s. Rivingtons, London, 1849.
1849. Etudes comparatives sur l'Armement des Vaisseaux en France et en Angleterre. 8 francs. Paris, 1849.
1849. G. W. Rogers. The Shipwright's own Book; being a key to most of the different kinds of lines made use of by Shipbuilders. 2 vols. 8vo. With drawings. 18s. Trübner, London, 1849.
1850. Professor Moseley. On Dynamical Stability, and on the Oscillations of floating Bodies. Transactions of the Royal Society. 1850.
1851. B. J. Totten. Naval Text Book: Letters to the Midshipmen of the United States Navy on Mastng, Rigging, and Managing Vessels of War; also a set of Stationary Tables, a Naval Gun Exercise, and a Marine Dictionary. 8vo. £1. Trübner, London, 1851.
1851. Thomas White. Theory and Practice of Shipbuilding. 8vo. Cloth, with a folio volume of plates. 16s. Weale, London, 1851.
1851. J. W. Griffiths. A Treatise on Marine and Naval Architecture; or Theory and Practice blended in Shipbuilding. 4to. Cloth, with engravings. £1 11s. 6d. Trübner, London, 1851.
1851. John Fincham, late Master Shipwright in Portsmouth Dockyard. A History of Naval Architecture. Royal 8vo. Cloth. 25s. Whittaker, London, 1851.
1852. D. S. Brown. America and Back in 48 Hours, India and Back in a Fortnight: being suggestions for certain Improvements in the Construction of Steam Vessels. 8vo. London, 1852.
1852. John Fincham. An Outline of Shipbuilding, in four parts. Third edition. Royal 8vo. Cloth, with a folio volume of plates. 31s. 6d. Whittaker, London, 1852.

A.D.

1852. C. B. Stuart, U.S.N. *The Naval Dry Docks of the United States*. Imperial 4to. With engravings and plans. £2 2s. Trübner, London, 1852.
1854. John Fincham. *A Treatise on Mastng Ships and Mast-making*. Third edition. Royal 8vo. Cloth, with a folio volume of plates. 25s. Whittaker, London, 1854.
1854. J. W. Griffiths. *The Shipbuilder's Manual and Nautical Referee*. 4to. Cloth, with engravings. £1 5s. 0d. Trubner, London, 1854.
1854. C. B. Stuart, U.S.N. *The Naval and Mail Steamers of the United States*. Imperial 4to. With drawings. £2 10s. Trubner, London, 1854.
1855. M. Viel, dessinateur au Ministère de la Marine. *Cours de Tracé et de Calculs de Déplacement et de Stabilité Hydrostatique des Batiments de Mer*. Accompagné de 29 planches. 15s. Paris, 1855.
1856. Sir John Rennie. *The Theory, Formation, and Construction of British and Foreign Harbours, Docks, and Naval Arsenals*. 2 vols. £18. Weale, London, 1856.
1857. Wilham Brady, Sailing Master, U.S.N. *The Kedge-Anchor, or Young Sailor's Assistant; appertaining to the Practical Evolutions of Modern Seamanship, Rigging, Knotting, &c.; also, Tables of Rigging, Spars, Sails, &c., relative to every class of vessels*. 8vo. Cloth, with engravings. 16s. Trubner, London, 1857.
1858. John Grantham. *Iron Shipbuilding, with Practical Illustrations*. 2s. 6d. Atlas of Plates to do. £1 2s. 6d. Weale, London, 1858.
1859. Bonnefoux et Paris. *Marine à Vapeur, seconde édition, accompagné de 17 grandes planches gravées, et de figures dans le texte*. Paris, 1859.
1859. *Articles on Shipbuilding. Mechanics' Magazine*. 1859 et seq.
1859. John Fincham. *Directions for laying-off Ships on the Mould-Loft Floor*. Third edition. Royal 8vo. Cloth, with a folio volume of plates. 25s. Whittaker, London, 1859.

## A.D.

1859. James P. Peake. Principles of the Science of Naval Architecture. 3 vols. in one. 3s. Weale, London, 1859.
1860. Transactions of the Institution of Naval Architects. 1860 et seq.
1860. M. Vitruvius. Ten Books on Civil, Military, and Naval Architecture, translated by Joseph Gwilt. 2 vols. with plates. 5s. Weale, London, 1860.
1860. R. Kipping. Mast-making, Mast-making, and Rigging of Ships. 1s. 6d. Weale, London, 1860.
1861. Capt. H. A. Sumnerfeldt, N.R.N. Elementary and Practical Construction of Ships for Ocean or River Service. With an Atlas of plates. 8s. 6d. Weale, London, 1861.
1861. Articles on the Theory and Practice of Shipbuilding; on Steam Ships, on Timber, and on Tonnage; from the Encyclopædia Britannica, eighth edition. In one vol. with plates. 14s. Black, Edinburgh, 1861.
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